SUPERPAK™

AST RESEARCH INC.

Versatile Software Including SuperDrive RAM Disk, SuperSpool Print Spooler and Additional Utility and Productivity Enhancement Programs



User's Manual

SuperPak™

User's Manual
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SECTION 1

INTRODUCTION

AST's software product SuperPak™ (Version 5.0 and above) consists of five utility programs — SuperDrive™, SuperSpool™, fASTdisk™, ASTCLOCK™, and RAMCLEAR™. Your SuperPak diskette includes these SuperPak utilities. It may also include many other valuable software programs for enhancing the performance of your AST Research expansion card and your entire PC system.

Different AST multifunction and graphics products require different software programs in order to operate the hardware, or to enhance its operation. Please note that some of the software on the SuperPak diskette may not be applicable to your particular AST product. Your SuperPak diskette may also contain non-AST software provided with your product.

1.1 Checklist

Before getting started, check that your AST Research product package includes the following items needed for SuperPak:

- SuperPak software diskette.
- *SuperPak User's Manual.*

1.2 Features

Brief descriptions follow of the five SuperPak utilities:

SuperDrive

A program which simulates up to four diskette drives within the random access memory (RAM) of your system. This RAM disk capability enables you to retrieve and store data and command (program) files within RAM, a much faster process than using an actual mechanical disk or diskette.

SuperSpool

A program which outputs data to a printer while permitting you to simultaneously perform other tasks on your PC. Your print output is stored in a predefined area of memory and sent from there to the printer. This frees your PC's microprocessor from having to waste its valuable processing time waiting for the printer. This means your PC can execute other software in the "foreground" while the printing of data is handled by SuperSpool in the "background".

fASTdisk

A program which simulates hard disk units within RAM. As with SuperDrive, data and programs can be retrieved and stored at RAM speeds using the virtual disk instead of an actual mechanical disk unit. The number of fASTdisks that you can create is limited only by your operating system. The size of each fASTdisk is limited only by the amount of available RAM and can be tailored to your needs. An installation command format compatible with IBM's VDISK is provided.

RAMCLEAR

A program which initializes areas of memory above the switch settings to avoid false parity errors.

ASTCLOCK

A program that works with the Clock-Calendar feature provided with certain AST Research products. The Clock-Calendar uses the ASTCLOCK program to set the time and date for you every time you turn on or reboot the computer. Refer to the *User's Manual* for your AST Research product to determine whether it has a Clock-Calendar and how to install its hardware and software.

1.3 Contents of the SuperPak Diskette

In addition to the five SuperPak utilities, there may be several other software products included on your SuperPak diskette. Information about each software product is contained in a file named READ.ME on the SuperPak diskette.

To list the READ.ME file on your display screen, boot up your PC with PC-DOS, place your SuperPak Diskette (or a copy of it) in diskette drive A:,and type in the following command:

A>**TYPE READ.ME**<**Enter**>

Word processing package commands can also be used to display and print out the READ.ME file.

1.4 System Requirements

The minimum requirements for use of the SuperPak software are an IBM PC or suitable IBM-compatible with 64 kilobytes (KB) of system memory, one floppy diskette drive, and IBM PC Disk Operating System (PC-DOS) (version 2.0 or later).

SuperPak software provided with an IBM PC-AT enhancement product will require a PC-AT or PC-AT-compatible computer with 256 KB of system memory, one floppy diskette drive, and IBM PC-DOS (version 3.0 or later).

1.5 How to Use This Manual

SuperPak utility programs will save you time and effort when installed and used properly. This manual is designed to be a user's manual that will guide you through the installation and use of the product. Read the instructions in this manual carefully to familiarize yourself with SuperPak's capabilities.

This section provides an outline of the format notation used throughout the manual, a list of related documentation, and an outline of the manual.

1.5.1 Format Notation

The following format notation is used in this manual:

- *Uppercase characters* indicate items (such as commands) that you enter exactly as shown. However, you can enter those items in any combination of upper- or lowercase letters.
- *Boldface* indicates information that you enter. A boldface entry can be a parameter such as a file name or a key to press.
- *Square brackets ([])* indicate an optional term which is included or omitted at your discretion. The brackets are not entered.
- *Lowercase letters* represent parameters that are defined by the user. While the user defines the parameters, they must satisfy the conditions of the command description.
- *Angle brackets (< >)* tell you to press a key. For example, <Esc> instructs you to press the "Esc" key. You do not have to press the "Enter" key unless you are specifically told to do so.
- System prompts and messages are shown in color.

1.5.2 Related Documentation

This manual assumes some familiarity with the PC-DOS operating system and the IBM PC, PC-XT, or PC-AT hardware. You can find this information in these manuals for your IBM PC:

Guide to Operations.

Technical Reference.

Disk Operating System.

There are several AST products that are designed to function with SuperPak. You should also refer to the User's Manual for your AST product.

1.5.3 Manual Outline

The following outline describes each section of this manual.

SECTION 1: INTRODUCTION
Contains a brief overview of the SuperPak utilities and this manual.

SECTION 2: GETTING STARTED
Provides basic information on operating the SuperPak programs, including how to copy SuperPak program files onto a DOS diskette and how to use AUTOEXEC and CONFIG.SYS files with SuperPak. Introductions to the three most commonly used programs, SuperDrive, SuperSpool and fASTdisk, provide descriptions of the utilities and the basic commands to operate them.

SECTION 3: MEMORY ALLOCATION
Provides an overview of how to allocate sections of memory for use by the SuperPak programs. Subsections suggest special considerations when using the AST Research products *RAMpage!* and RAMpage AT, and when PC-AT extended memory is present. Examples of commands that include memory allocation options are included.

SECTION 4: SUPERDRIVE

Gives the basic and advanced command options for installing the utility, and provides example commands. Some suggestions for handling particular tasks while using SuperDrive are also provided.

SECTION 5: SUPERSPOOL

Provides basic and advanced command options for installing the utility, and includes example commands. Also offers suggestions for accomplishing particular tasks.

SECTION 6: fASTdisk

Describes two command formats for installing the utility in your CONFIG.SYS file, and provides some rules for using fASTdisk.

SECTION 7: RAMCLEAR

Provides a description of RAMCLEAR, command forms for installing the utility, and example commands.

APPENDIX A: GLOSSARY

Defines some of the technical terms used in this manual.

APPENDIX B: PATCHING DOS FOR ADDITIONAL DRIVES

Includes instructions for patching PC-DOS in order to prepare your PC for the additional diskette drives provided by SuperDrive.

APPENDIX C: HARDWARE INTERRUPT LINES

Lists the standard Interrupt Request (IRQ) numbers used on most PCs and on the PC-AT.

APPENDIX D: CREATING AUTOEXEC AND CONFIG.SYS FILES

Describes how to create and modify an AUTOEXEC or CONFIG.SYS file to include SuperPak commands.

APPENDIX E: SUPERDRIVE, SUPERSPOOL, AND fASTdisk: RULES FOR USING THEM TOGETHER

Offers some guidelines to remember when using several SuperPak utilities together.

SECTION 2

GETTING STARTED

This section describes how to prepare your PC boot diskette in order to use any of the SuperPak programs. It also includes descriptions and basic operating instructions for the primary SuperPak utilities, SuperDrive, SuperSpool, and fASTdisk. RAMCLEAR is fully described in Section 7. ASTCLOCK is described in the User's Manual for AST products with clock-calendars. Special files used to install the SuperPak programs, the AUTOEXEC.BAT and CONFIG.SYS files, are introduced.

2.1 Backing Up Your Software Diskettes

In order to get started using the SuperPak utilities, you should make a backup copy of the PC Disk Operating System (PC-DOS) boot diskette, using the DOS COPY or DISKCOPY command. This way, you will have your original DOS diskette in case any problems are encountered while preparing your DOS diskette to include SuperPak programs.

You should also make a copy of your SuperPak software diskette. Store away your original DOS and SuperPak diskettes. In the rest of this section, your backup copies will be referred to as your *DOS diskette* and your *SuperPak diskette*.

2.2 Copying SuperPak onto a Dos Diskette

To copy the SuperPak utilities onto your DOS diskette, you will need to use the DOS COPY command. Any AST software diskette is compatible with the COPY command of DOS 2.x and 3.x.

There are many files on your SuperPak diskette in addition to the five SuperPak utilities listed above. The *READ.ME* file on your SuperPak diskette has information about all the files on your diskette and whether they can be used with your AST Research product. You can list this file with a DOS TYPE command, as described in Section 1.3. A word processing package can also be used to display or print out the file.

2.2.1 Copying the Entire SuperPak Diskette

If you want to copy ALL the programs from your SuperPak diskette onto your DOS diskette, proceed through the following steps. (You may also refer to the discussion of the COPY command in your *DOS Manual.*)

STEP 1
Write protect your SuperPak diskette: Place a write-protect tab on your backup copy of the SuperPak diskette. This will prevent accidental erasure during the copying process.

STEP 2
Boot the system with your DOS diskette: This is done by placing the DOS diskette in drive A: and pressing the keys **<CTRL>-<ALT>-<DEL>**.

STEP 3
Copy the SuperPak diskette contents onto your DOS diskette: If you have only one floppy drive, enter:

A>**COPY B:*.* A:<Enter>**

The system will prompt you to swap between the DOS diskette (diskette A:) and the diskette containing SuperPak (diskette B:).

If you have two or more floppy drives, place the SuperPak diskette in drive B: and enter:

A>**COPY B:*.* A:<Enter>**

By following STEPS 1 through 3, you will copy over all the programs on the diskette that contains the SuperPak utilities to your working DOS diskette.

2.2.2 Copying the SuperPak Utilities

The file names for the five SuperPak utilities are given in Table 2-1:

Table 2-1. SuperPak Utility File Names.

Utility Name	File Name
SuperDrive	SUPERDRV.COM
SuperSpool	SUPERSPL.COM
fASTdisk	FASTDISK.SYS
RAMCLEAR	RAMCLEAR.COM
ASTCLOCK	ASTCLOCK.COM

NOTE

The SuperDrive, SuperSpool, and fASTdisk utilities can be used with every AST Research product that provides a SuperPak diskette. RAMCLEAR cannot be used with expanded memory products or PC-AT extended memory. The ASTCLOCK utility can only be used if your AST product has a Clock-Calendar feature.

To copy the SuperPak utility programs from the SuperPak diskette onto a DOS diskette, follow STEPS 1 to 3 given in Section 2.2.1. However, in STEP 3, substitute one or more of the following five COPY commands:

A>**COPY B:SUPERDRV.COM A:<Enter>** (for SuperDrive)

A>**COPY B:SUPERSPL.COM A:<Enter>** (for SuperSpool)

A>**COPY B:FASTDISK.SYS A:<Enter>** (for fASTdisk)

A>**COPY B:ASTCLOCK.COM A:<Enter>** (for ASTCLOCK)

A>**COPY B:RAMCLEAR.COM A:<Enter>** (for RAMCLEAR)

2.3 AUTOEXEC.BAT and CONFIG.SYS Files

AUTOEXEC.BAT is the name of a batch file that DOS searches for and executes whenever you start or restart your PC using DOS. You can initiate all the SuperPak utilities except fASTdisk automatically each time you start or restart your PC by placing the commands needed to run those utilities in the AUTOEXEC.BAT file on your boot diskette.

fASTdisk must be initiated by placing a command in the CONFIG.SYS file, which is also run automatically whenever your PC is started up. The CONFIG.SYS file is used to vary the default configuration for your PC. Like the AUTOEXEC.BAT file, the CONFIG.SYS file on your DOS boot is automatically executed by DOS whenever your PC is started or restarted.

One of several commands that can be included in a CONFIG.SYS file is the DEVICE command, which installs a software device driver. A *device driver* is a program which helps your applications software make use of specific hardware you have in your PC. The DEVICE command is used to install fASTdisk, which is a device driver.

Your SuperPak diskette may include sample AUTOEXEC.BAT and CONFIG.SYS files for installing the SuperPak utilities that you can use as is or modify. Check the *User's Manual* for your AST product to see whether AUTOEXEC.BAT and CONFIG.SYS files appropriate for your AST product and PC configuration are included on the SuperPak diskette.

See Appendix D for information on how to create or modify an AUTOEXEC.BAT or CONFIG.SYS file.

2.4 Getting Acquainted with SuperDrive

The SuperDrive "electronic diskette drive" program can greatly enhance the processing speed of your IBM Personal Computer (PC). You can now assign random access memory (RAM) space for use as up to four SuperDrive electronic disk drives and retrieve data or programs at "RAM speeds", much faster than a mechanical disk would allow.

Think of SuperDrive as a super-fast floppy disk drive. Once it has been created, you can COPY to it or COPY from it, ERASE files from it, run CHKDSK on it, or perform just about any other DOS command with it. However, because SuperDrive is a program, just like a word processor or general ledger program, it must be "set up" each time you turn on the computer, and it will "go away" whenever the computer is turned off.

2.4.1 SuperDrive Features

SuperDrive includes these features:

- Allows simulation of up to four floppy disk drives.
- Allows a simulated floppy drive to be inserted between existing physical floppy drives.
- Allows you to define the size of simulated floppy drives and to reserve space for applications programs.
- Allows you to restrict SuperDrive operation to specific areas of memory.
- On PCs other than the PC-AT, supports single- and double-sided electronic drives, eight or nine sectors per track, and up to 360 kilobytes (KB) in size.
- On a PC-AT, supports 1.2 megabyte (MB) electronic drives, which are double-sided, have 80 tracks with 15 sectors per track.
- Is compatible with IBM PC-DOS and the IBM hard disk system.

Many of these features are provided by using the basic and advanced SuperDrive options described in Section 4.

2.4.2 Preparing PC and PC-XT Hardware for SuperDrive

This section describes how to prepare your PC or PC-XT for SuperDrive operation. (Appendix B presents an alternative procedure, allowing you to apply patches to DOS instead of changing any hardware settings.) Normally, you will have to do this only once. After you have set up the PC or PC-XT as described below, no further hardware preparation is necessary.

SETTING SWITCHES FOR SUPERDRIVE

NOTE

> If you have only one physical floppy drive, you must copy the SuperPak software to your boot diskette before you change the system board switches.

PC System Board Switch SW1 — System board switch SW1 positions 1, 7, and 8 are used in all versions of the PC except the PC-AT, to tell the computer how many floppy diskette drives are present. Since a SuperDrive is treated just like any other floppy drive, these switches must be set to reflect the total number of drives, including SuperDrives.

Example
If there is currently one floppy drive in your PC, system board switch positions SW1-7 and SW1-8 will probably be ON (SW1-1 is always OFF). If you intend to use two SuperDrive disk drives in addition to your floppy drive, you must tell the computer you have three drives, which would be SW1-7 ON and SW1-8 OFF.

Table 2-2 shows the SW1 switch settings and drive designations possible when using SuperDrive. In this table, "S-Drive" stands for SuperDrive.

Table 2-2. System Board Switch SW1 Settings (PC and PC-XT).

Total No. of Drives	System Board Switch SW1 1	7	8	Possible Floppy and/or S-Drive Designations	IBM Fixed Disk Designations*
1	OFF	ON	ON	A: (No S-Drive)	C: etc.*
2	OFF	OFF	ON	A: B:	C: etc.*
3	OFF	ON	OFF	A: B: C:	D: etc.*
4	OFF	OFF	OFF	A: B: C: D:	E: etc.*

* Applies only to computers equipped with an IBM fixed disk, such as the PC-XT, and should be ignored by other users. In the PC-XT, the switch setting refers to the total number of floppy drives and SuperDrives only. The IBM fixed disk is *excluded* from this total.

You can leave the switches set for a total of three or four drives, even if you don't intend to always run with that many floppy drives and/or SuperDrives, or even if you occasionally work without SuperDrive. Of course, the system would then think there really are three or four drives and would accept commands the operator might issue to the nonexistent drives. If this happens, the system is *smart* enough to recover from the error and will give the user an opportunity to abort the operation. However, to avoid false errors when running the IBM diagnostics, you will probably want to set the switches back to the number of floppy drives in your system.

2.4.3 Preparing the PC-AT for SuperDrive

To prepare for installing SuperDrive floppy drives on a PC-AT, instead of setting a switch on the system board, you should run the PC-AT SETUP and Diagnostic program. Brief instructions for running SETUP follow.

STEP 1
Diagnostic Program Boot Up: Boot the PC-AT with the IBM "Diagnostics for IBM Personal Computer AT" diskette. This diskette is found at the back of the *Guide to Operations* manual for the PC-AT.

STEP 2
Run SETUP: Select Option 4, "SETUP". Answer the questions as appropriate for the number of SuperDrive floppy drives you wish to create.

SETUP will ask you a number of questions about your PC-AT configuration that are unrelated to SuperDrive. (For example, it verifies the monitor type, time, date, memory allocation, and so forth.) There is no need to change any of these parameters unless one is in error.

2.4.4 Basic SUPERDRV Command

Because SuperDrive is a program, just like a word processor or general ledger program, it must be initialized each time you turn on your PC. The SUPERDRV command initializes SuperDrive for your PC. The simplest form of the SUPERDRV command is as follows:

SUPERDRV C:<Enter>

This command creates a 360-KB double-sided, double-density SuperDrive C:. A minimum of 64 KB of memory is reserved for use by applications programs. This command can be placed in an AUTOEXEC file to initiate SuperDrive automatically when you start or restart your PC.

This may be all you need to know to run SuperDrive on your PC. Refer to Sections 3 and 4 if you wish to vary the basic SuperDrive configuration and/or memory allocation. The SUPERDRV command options described in Section 4 and the overview of memory allocation strategies in Section 3 provide information on how to modify the basic SuperDrive to meet special requirements. Prepared AUTOEXEC.BAT files on your SuperPak diskette for use with *RAMpage!* or RAMpage AT may provide ready-made command forms suited to your needs (check your AST product User's Manual).

2.4.5 Sample SuperDrive Session

This section takes you step-by-step through the process of creating and using a SuperDrive. We assume that you have two double-sided floppy drives and that you want to create a double-sided SuperDrive as drive C:. You should have previously set up the system board switches or PC-AT SETUP program for at least three drives.

STEP 1
Create the SuperDrive: Enter a command such as the following (this command can also be incorporated in your AUTOEXEC.BAT file to automatically create a SuperDrive every time you boot up your PC).

SUPERDRV C:<Enter>

SuperDrive responds on the screen with a message similar to the one shown in Figure 2-1:

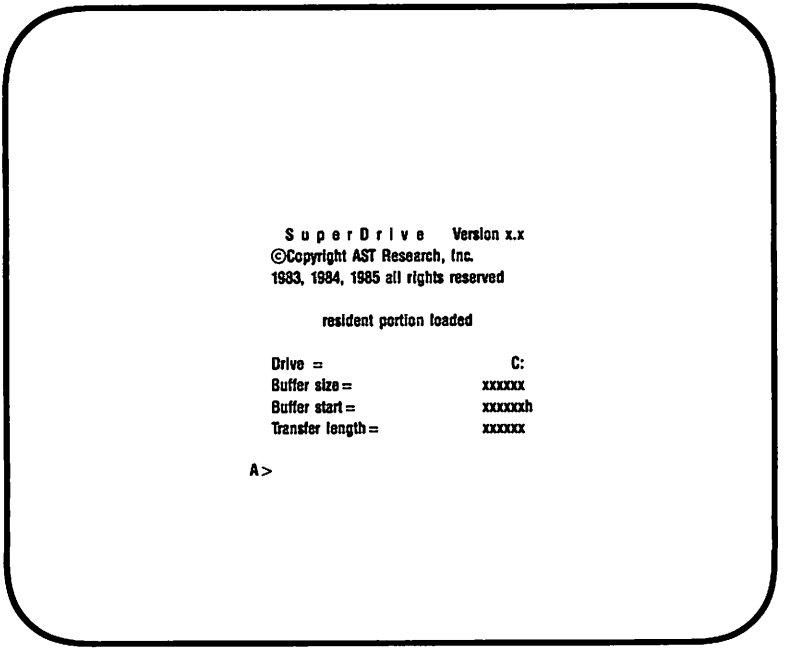


Figure 2-1. Sample Screen for SuperDrive.

where:

Drive = shows the letter designating the SuperDrive.

Buffer size = shows the capacity of the SuperDrive in bytes.

Buffer start = displays the hexadecimal starting memory address of SuperDrive.

Transfer length = shows the maximum number of bytes that can be transferred in or out of memory above 1 MB at one time. This line is only shown when the SuperDrive uses some memory at or above 1 MB.

If you received an error message while attempting to create a SuperDrive, refer to Section 4.6.

STEP 2
Copy all of the files from drive A: to drive C:. Here we assume that the diskette in drive A: contains all of the programs and data files that you want to copy to the SuperDrive.

COPY A:*.* C:<Enter> (to copy file by file)

or

DISKCOPY A: C:<Enter> (if both drives are the same size)

STEP 3
Change the default drive from drive A: to drive C:.

C:<Enter>

STEP 4
Execute the program you want to run from the SuperDrive.

filename<Enter>

where filename is the name of the program.

That's all there is to it. Now you can treat the SuperDrive just like a floppy drive WITH ONE EXCEPTION. That is, if you create any new data on the SuperDrive that you wish to save, you must copy it to a permanent storage medium when you are done (to either a floppy diskette or hard disk). Data stored on a SuperDrive will be lost when you turn off the computer!

2.5 Getting Acquainted with SuperSpool

The SuperSpool program provides buffered output of print data to a parallel or serial printer while running other programs *at the same time.* Files to be printed will be output to the SuperSpool buffers at the maximum I/O speed allowed by the DOS, while SuperSpool handles output to the printer at printer speed. SuperSpool operates in the "background" and frees the operating system for other tasks, such as executing another program.

A simple example of one of the things you can do with SuperSpool is to print a listing of a BASIC program while running that same program on your PC. In effect, the BASIC program code is dumped into the print buffer, which then releases control of the program to the operating system.

2.5.1 SuperSpool Features

SuperSpool includes these features:

- Provides buffered output of print data to either a parallel or serial printer.
- Provides a simple command sequence that allows you to specify printer ports as well as serial output Baud rates and line conditions.
- Allows you to define the size of the spool buffer and control its location in memory.
- Allows stop/restart, previous page, and line-per-page controls to be invoked from the keyboard.

- SuperSpool's "straight wire" spool buffer does not modify print file data.
- Compatible with DOS, SuperDrive, and fASTdisk.
- Compatible with IBM PCs with 64 or 256 KB of memory installed on the system board, PC-XT, and PC-AT, Portable PC, and PCjr.

Many of these features are provided by using the basic and advanced SuperSpool options described in Section 5.

2.5.2 Preparing PC-DOS for SuperSpool

If you are using SuperSpool with a parallel printer, before you enter your SuperSpool command, you must enter the DOS MODE command. (MODE.COM program comes with PC-DOS, and should be on your DOS diskette.)

MODE LPT1:<Enter>

The DOS response is:

LPT1: not redirected

This response is normal and not an indication of an error. The MODE LPT1: command should be used even if you are using a serial printer. You only need to enter the MODE LPT1: command once at the start of each computing session.

2.5.3 Basic SUPERSPL Command

Because SuperSpool is a program, it must be initialized each time you turn on your PC. The SUPERSPL command initiates the SuperSpool utility and sets parameters for its operation. The basic forms of the SUPERSPL command for serial printers and parallel printers are given here.

The basic form of the SUPERSPL command for a parallel printer is:

SUPERSPL LPT1: <Enter>

This command spools printer output to LPT1. 64 KB is reserved for use by the spool buffer, and another 64 KB is reserved for use by applications programs.

The basic form of the SUPERSPL command for a serial printer is:

SUPERSPL LPT1: = COM1:[/RATE = xxxx] <Enter>

The memory allocation for a serial printer is the same as for a parallel printer — 64 KB for the spool buffer and 64 KB minimum reserved for applications programs.

This command spools printer output to serial port COM1 at even parity and 7 databits.

The Baud rate of the serial communication adapter must be specified (as 110, 150, 300, 600, 1200, 2400, 4800, or 9600 Baud). If the Baud rate is 110, the default stopbits value is 2. Otherwise the default stopbits value is 1. The port line protocol options CTS and DSR are ON.

To change the values for features such as output port specifications, memory allocation, and serial printer configuration, many options are provided for adding to the basic command. These options are given in Section 5. Section 3 also provides pertinent information on memory allocation.

2.5.4 SuperSpool Sample Session

This sample session shows the step-by-step procedure to use in bringing up SuperSpool. This example assumes that the diskette in drive A: contains MODE.COM and SUPERSPL.COM. It also assumes that there is sufficient memory in the system

to successfully execute the SuperSpool commands. The commands shown here can be placed in your AUTOEXEC.BAT file to initiate SuperSpool automatically each time you start or restart your PC.

STEP 1
Prepare DOS for SuperSpool by using the MODE command:

A>**MODE LPT1:<Enter>**

The DOS response is:

Resident portion of MODE loaded

LPT1: not redirected.

STEP 2 *Specify the SuperSpool command for your printer:*
This example illustrates a command for a parallel printer.

A>**SUPERSPL LPT1:<Enter>**

SuperSpool responds with a message similar to that shown in Figure 2-2, indicating that SuperSpool has loaded itself into memory.

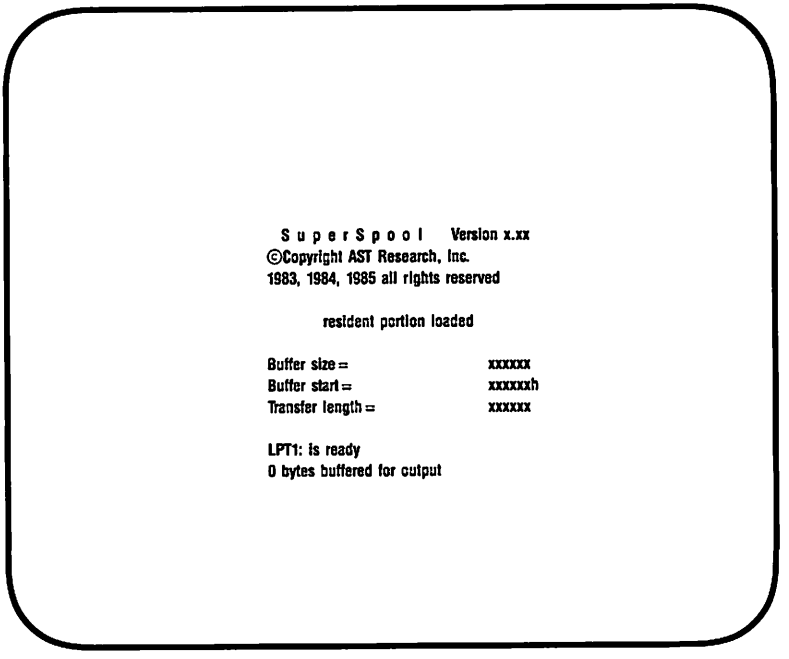


Figure 2-2. Sample Screen for SuperSpool.

where:

Buffer size = tells how many bytes are reserved for the spool buffer.

Buffer start = tells at what hexadecimal address the SuperSpool buffer starts.

Transfer length = shows the maximum number of bytes that can be transferred in or out of memory above 1 MB at one time. This line is only shown if SuperSpool uses some memory at or above 1 MB.

LPT1 is where spooling will be routed.

0 bytes of data are currently contained in the SuperSpool buffer (since nothing has been printed yet).

If a command had been given for a serial printer instead of a parallel printer, SuperSpool would also inform us that LPT1 is being redirected to COM1 or COM2. It would also tell you which of the signals DCD, DSR, CTS, and XON/XOFF are being monitored ("required ON for output").

STEP 3
Test the spooler: Enter the Print Screen command (<**Shift**>-<**PrtSc**>). The cursor will "fly" down the screen as data is sent to the spool buffer, while SuperSpool outputs the data from the spool buffer to the printer at whatever rate the printer will accept it.

Now you can run whatever program you want and let SuperSpool handle output of data to the printer for you.

2.6 Getting Acquainted with fASTdisk

The fASTdisk program uses RAM to create an electronic, virtual hard disk unit in your PC. You can access fAStdisk faster than you would be able to access a disk unit peripheral. Furthermore, fASTdisk is designed to coordinate its operation with SuperDrive and SuperSpool while avoiding memory conflicts.

Because fASTdisk resides in RAM, however, information only resides in it while your PC is turned on. As soon as the PC is turned off, all the information stored in fASTdisk goes away. Therefore you must save fASTdisk data to a permanent storage medium such as a floppy diskette or a hard disk peripheral. Once installed, your fASTdisk is initialized each time you turn on your computer.

2.6.1 fASTdisk FEATURES

fASTdisk includes these features:

- Allows great flexibility in the virtual disk's buffer size. The buffer size of the virtual disk is limited by the amount of RAM installed in your PC.

- Permits creation of multiple fASTdisk volumes. The number is limited only by DOS. (The limit for DOS version 3.10 is 26 volumes total per system.)

- Can be installed purely through software. No hardware switch settings need to be changed in order to install fASTdisk.

- Allows you to define the size of applications program memory space and fASTdisk memory space. Sector size and the number of directory entries can also be specified.

- Allows you to restrict fASTdisk operation to specific areas of memory.

- Automatically creates a volume label for each fASTdisk. Also, each fASTdisk is automatically formatted.

- Is compatible with the IBM PC-DOS, IBM's VDISK RAMdisk, and the IBM hard disk system.

- Provides an alternative installation command syntax that is similar to IBM's VDISK RAM disk installation command.

Some of these features require using some of the basic and advanced command options described in Section 6.

2.6.2 Installing fASTdisk

To install the fASTdisk program on your PC, all you must do is place a fASTdisk DEVICE command in the CONFIG.SYS file portion of DOS on your boot diskette. Once this is done, your PC automatically starts up or restarts with a fASTdisk electronic disk unit in operation.

The CONFIG.SYS file is part of DOS that is executed each time you start or restart your PC. (CONFIG.SYS files are described in Section 2.3.). fASTdisk is a *device driver* program that is installed in the CONFIG.SYS file with a DOS DEVICE command. Device drivers are programs which allow extra peripheral devices such as disk drives to be linked into DOS.

To initiate fASTdisk for the first time, you must place a fASTdisk DEVICE command in the CONFIG.SYS file on your boot diskette and then restart your PC. After this, it will be initiated automatically each time your PC is started or restarted.

The DEVICE = FASTDISK.SYS command must follow any DEVICE commands in the CONFIG.SYS file that affect the functioning of fASTdisk. For example, if the AST products *RAMpage!* or RAMpage AT are being used, then DEVICE commands for the REMM and REX device drivers must precede the fASTdisk DEVICE command.

Refer to Appendix D for instructions on how to create or modify a CONFIG.SYS file.

2.6.3 Basic fASTdisk DEVICE Command

The basic form of the DEVICE command used to install a fASTdisk in the CONFIG.SYS file is as follows:

DEVICE = FASTDISK.SYS

If this command is placed in the CONFIG.SYS file, fASTdisk will operate with the following default parameters:

Sector Size = 128 bytes
Directory Size = 64 files
Disk Capacity = 512 KB
Applications Program Space = 64 KB

In the default configuration, fASTdisk will use conventional memory (0—640 KB), not expanded memory or PC-AT extended memory, which are both above 640 KB.

NOTE

The default memory allocation to fASTdisk is 512 KB. If your PC has less than 512 KB of memory available for use as a fAStdisk, you can limit the size of fASTdisk using the */M[=xxx]* option (described in Section 6.1.2).

If you wish to vary some of the operating parameters from the defaults shown above, you will need to specify them in your DEVICE command for fASTdisk. The options allowing you to do this are described in Section 6.

The SuperPak diskette includes ready-made CONFIG.SYS files with fASTdisk DEVICE commands that are appropriate for use with *RAMpage!* and RAMpage AT with certain PC configurations. Check your AST product User's Manual for further information.

(If you have a CONFIG.SYS file that has a VDISK command in it, and you would like to use fASTdisk instead of VDISK, all you have to do is substitute FASTDISK.SYS where your DEVICE command currently reads VDISK.SYS, and copy the FASTDISK program onto your boot diskette. The command forms are compatible between the two utilities, so only minor changes will be needed, if any.)

2.6.4 Sample fASTdisk Session

This section steps you through the process of creating and using a fASTdisk.

STEP 1
Create a fASTdisk: Enter a command such as the following in your CONFIG.SYS file. (If you have REMM.SYS and REX.SYS commands in your CONFIG.SYS file, then your fASTdisk command must follow them.)

DEVICE = FASTDISK.SYS

STEP 2

Reboot your PC: Press the <**Alt**>-<**Ctrl**>-<**Del**> key sequence. At the point at which the DEVICE command installing fASTdisk has just been executed by DOS, fASTdisk responds on the screen with a message similar to Figure 2-3:

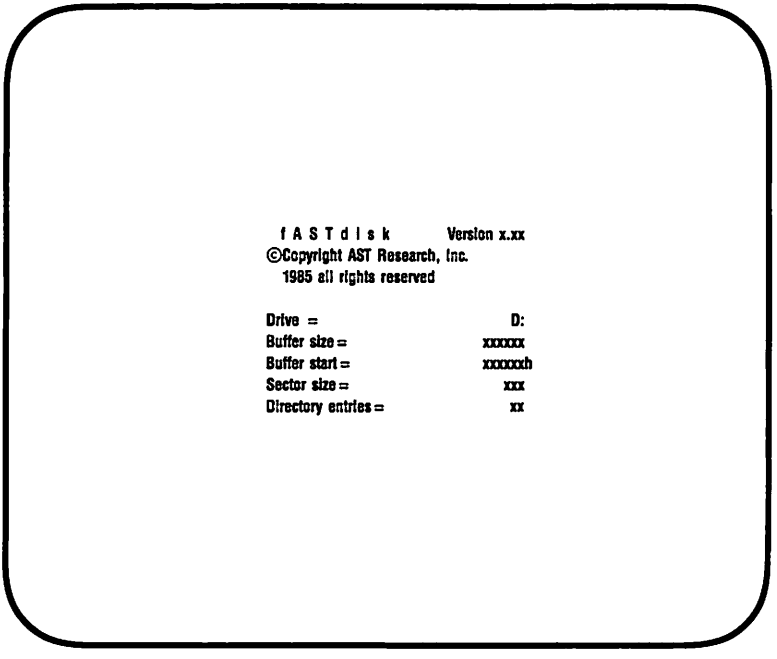


Figure 2-3. Sample Screen for fASTdisk.

where:

Drive = displays the letter designating the fASTdisk. In the sample screen above, the letter is D:. This letter is used to identify the fASTdisk in DOS commands for copying files and running programs.

Buffer size = tells how many bytes are reserved for the fASTdisk buffer. The default is 524288 (512 KB).

Buffer start = is the hexadecimal address at which the fASTdisk buffer starts.

Sector size = shows the sector size in bytes. The default is 128 bytes. The sector size may be automatically adjusted to a different size than what is specified, in which case a message "adjusted" is displayed at the bottom of the display.

Directory entries = displays the maximum number of entries allowed in the root directory. The default is 64.

If your version of DOS is earlier than 3.0, then the fAStdisk drive letter is not shown in the display. (The letter used is the first letter in the alphabet not already used for a diskette drive, SuperDrive, or other device. This is usually C: or D:, but may be E: or higher.) You can check the letter by using the DOS DIR command, using the following command:

A>**DIR X:**<**Enter**>

where X is any identifying letter.

If the drive specified in a DIR command is a fASTdisk, then the following response is returned:

Volume in drive X is fASTdiskx.xx

where X is a letter identifying the fASTdisk and x.xx is the version number of the fASTdisk program.

STEP 3

Use your fASTdisk: For copying files and running programs, the command syntax is the same as for a diskette drive. To copy files from a diskette in drive A: to a fASTdisk C:, enter the following command:

A>**COPY A:*.* C:**<**Enter**>

Enter the initiating command from the C: prompt to run a program on fASTdisk:

C>[initiating command]<**Enter**>

As with SuperDrive, any data stored on a fASTdisk must be saved to a permanent storage medium, such as a floppy diskette, before you turn off your PC.

SECTION 3

MEMORY ALLOCATION

This section provides information on how to allocate memory to SuperDrive, SuperSpool, and fASTdisk to make the best use of your particular PC configuration. An overview of the memory regions recognized by these utilities is followed by a summary of the memory allocation options. Information and examples pertaining to memory allocation with several different PC configurations are also offered.

More detailed information on the command options for SuperDrive, SuperSpool, and fASTdisk are provided in Sections 4, 5, and 6, respectively. You may prefer to go directly to these sections dealing with specific utilities. However, if you plan to use more than one utility, then the general overview pertaining to all three utilities given in this section is helpful.

3.1 Memory Configuration

To make the most efficient use of all available memory, it helps to understand how SuperDrive, SuperSpool, and fASTdisk allocate memory.

There are several memory regions recognized by the SuperPak utilities that are affected by the memory allocation options. Your PC configuration may contain only some of these areas. The memory regions are as follows:

- *Low memory* — memory in the range from 0 to 640 kilobytes (KB) without gaps in addressing, which is below the amount of system memory indicated by the PC system board switches. Some memory of this type is present in almost every PC configuration.

- *Extended memory* — memory in the 1 to 16 megabyte (MB) address range on the PC-AT. This memory can be used for data storage by SuperDrive, SuperSpool and fASTdisk. Extended memory is only used if enabled by the */EXTM* command option.

- *Expanded memory — RAMpage!* or RAMpage AT memory used to expand your computer's memory beyond 640 KB of system memory. This memory can be used for data storage by SuperDrive, SuperSpool, and fASTdisk when expanded memory is used as simulated extended memory by means of the RAMpage Extended Memory Emulator (REX) program provided with *RAMpage!* and RAMpage AT. Expanded memory is only used if enabled by the */EXTM* command option.

The following two memory regions are present in fewer PC configurations than the first three regions listed:

- *High memory* — memory in the range from from 0 to 640 KB (without gaps in addressing), which is *above* the amount of system memory indicated by the PC system board switches. High memory cannot exist in the PC-XT or PC-AT.

- *Noncontiguous memory* — memory above :C0000 (hexadecimal) that begins after a gap in addressing in certain configurations of the 64-KB PC with the original ROM BIOS installed (example configurations are given in the definition in Appendix A).

3.2 How SuperPak Utilities Allocate Memory

The following is a list of how the SuperDrive, SuperSpool, and fASTdisk utilities allocate memory in the regions listed above, shown in the order in which those regions are used.

1. Extended or expanded memory (used as extended memory) at or above 1 MB is used first if it is present and IF the */EXTM* option is in use. Memory is allocated from the lowest available memory above 1 MB upwards. Once the available memory in this area is exhausted, any additional memory needed is allocated from the next available area.

 In addition to any extended/expanded memory being used, resident code for the utilities and an intermediate spooling buffer for SuperSpool will always be allocated below 1 MB.

2. Noncontiguous memory is used next if it is present. This memory is allocated starting at the highest end and working downward.

3. High memory is allocated next, if it is present. This memory is allocated starting at the high end and working downward.

4. Low memory is allocated last; in many cases this is the only type of memory present. SuperDrive, SuperSpool, and fASTdisk put themselves into low memory just above the Disk Operating System (DOS) and displace the user's area upward toward the end of memory.

3.3 Memory Allocation Options

Optional command parameters can be used to alter the default amount and areas of memory allocated by the SuperPak utilities. A brief description of the memory allocation

options follows. (More detailed descriptions are found in Sections 4, 5, and 6). Each option described can be used in a command by adding it to the end of one of the basic command forms for the utilities described in Section 2.

3.3.1 Allocating Memory to a Utility

SuperDrive, SuperSpool, and fASTdisk can use different forms of the */M=xxx* option (where xxx is a number of KB), to alter the default amount of memory allocated for their use. The option has a slightly different format and usage for each utility.

With SuperDrive, you can use the */M=xxx* option only to limit the memory allocation to less than the default size for its drive configuration. You cannot increase the amount of memory used beyond the drive configuration capacity (360 KB, except on a PC-AT).

With SuperSpool, you can use the */M=xxx* option to decrease or increase the default size of the SuperSpool buffer (64 KB). The */M* form of the option can also be used to allocate all remaining available memory to the SuperSpool buffer.

With fASTdisk, you can use the */M=xxx* option to decrease or increase the default storage size of each fASTdisk (512 KB). As with SuperSpool, you can use the */M* form of the option form to allocate all remaining available memory to fASTdisk.

Examples
To create a double-sided, double-density SuperDrive with 200 KB of memory, and a SuperSpool with a 100-KB spool buffer (for a parallel printer), enter the following commands:

SUPERDRV C:/M=200<Enter>
SUPERSPL LPT1:/M=100<Enter>

3.3.2 Reserving Memory for a Program

You can use the */U = xxx* option (where xxx is a number of KB) to alter the default amount of memory (64 KB) reserved for an applications program. Usually, this option is used to reserve memory for an applications program *other* than a SuperPak utility. In this case, the */U = xxx* option should be the same in each SuperPak utility command. (Only the amount specified in the most recent command remains reserved.)

Occasionally, you may want to use the */U = xxx* option to reserve space for another SuperPak utility. In this case it is appropriate to specify different amounts of memory in different SuperPak utility commands.

For example, if you were to create a fAStdisk with an */M* option assigning it ALL available memory, you could reserve 400 KB for use with other utilities by adding the */U = 400* option. In a following SuperSpool command, you could then include the */M* and */U = 300* options in order to use ALL remaining memory (minus the 300 KB) for a SuperDrive.

Examples
To reserve 150 KB for use with applications programs other than the SuperPak utilities while creating a 360-KB SuperDrive and a 100-KB fASTdisk, use the following commands:

```
DEVICE = FASTDISK.SYS/M = 100/U = 150
SUPERDRV C:/U = 150 <Enter>
```

3.3.3 Enabling and Disabling Memory Regions

Several options are provided to enable or disable the utilities from using the regions of memory described at the beginning of Section 3.1.

The */EXTM* option allows you to use extended (PC-AT) or expanded (*RAMpage!*) memory simulating extended memory. This option allows SuperDrive, SuperSpool, and fASTdisk to store data in expanded/extended memory above 1 MB. However, resident code for the three programs, and an intermediate buffer for SuperSpool, will still be located in memory below 1 MB.

Two optional numeric fields can be used to limit the amount and range of memory above 1 MB available. The */EXTM[=xxxx[,xxxx]]* option form includes these two fields.

Once the */EXTM* option is invoked in one SuperPak utility command, all following fASTdisk, SuperDrive, and SuperSpool commands automatically apply the same option. However, you can use the */DEXTM* option in a later command to disable use of expanded/extended memory (only in the command that specifies */DEXTM*).

The */DL*, */DH*, and */DNC* options disable use of low, high, and noncontiguous memory, respectively. You can use these options with SuperDrive, SuperSpool, or fASTdisk commands. The */DL* option is the most frequently used of these three, since each PC configuration has some low memory in addition to any other memory regions it may have.

Example
To enable use of expanded memory above 1 MB for use with a 360-KB SuperDrive and disable use of any lower memory by SuperDrive (except lower memory needed for resident code), enter the following command:

SUPERDRV C:/EXTM/DL<Enter>

3.4 Planning Allocation for 1 MB or Less

Many PCs, PC-XTs, and PC-ATs have 1 MB or less total memory. The following formula can help you to decide how to allocate your memory.

	xxxx KB	Total actual memory installed.
–	032 KB	Approximate DOS requirement.
–	yyy KB	Memory required by user program.
=	uuuu KB	Memory available to SuperDrive, SuperSpool, a fASTdisk (approximate).

The memory allocation options that apply to this type of configuration are */U* = xxx, */M* = xxx, */DL*, */DH*, and */DNC*. If you have a PC-XT or PC-AT, the */DH* option will not apply to you because there is no high memory on those configurations. Only a few configurations have noncontiguous memory. Examples follow of how these options can be used to allocate PC memory to the SuperPak programs.

3.4.1 Memory Allocation Examples

The diagrams that accompany the following examples are intended for illustration purposes only. The relative memory area sizes are not necessarily depicted to scale. These examples assume that you are using DOS 2.1.

Example 1
You have 640 KB total memory, and your system board switches are set at 512 KB. You have two double-sided floppies. You want to create two double-sided SuperDrives as drives C: and D:, and you need to reserve 128 KB for your applications program. Whatever is left is to be used as a spooling buffer. The equation would be:

	640 KB	Total actual memory installed.
–	032 KB	Approximate DOS memory requirement.
–	128 KB	Memory required by user program.
=	480 KB	Memory available to SuperDrive, SuperSpool, and fASTdisk (approximate).

Since there is insufficient memory to create two, double- sided SuperDrives, we will create one full-sized drive and one smaller drive with the following commands.

SUPERDRV C:/U = 128 <Enter>
SUPERDRV D:/U = 128/M = 50 <Enter>
SUPERSPL LPT1:/U = 128/M <Enter>

These commands will work in this priority:

1. Reserves 128 KB of memory (always in low memory) for your applications program.

2. Creates a double-sided SuperDrive as drive C:. The resident (program) portion will be in low memory. The 360-KB drive will be created first out of whatever is remaining in high memory, and then starts using low memory, pushing up the user memory area.

3. Creates a double-sided, 50-KB SuperDrive as drive D:. Since the SuperDrive program code is already in memory, all that need be done is to create the buffer portion, which will locate immediately above the drive C: buffer. This again pushes up the 128-KB user memory area.

4. The size of the SuperSpool buffer (for LPT1) will be whatever memory space is left (via the */M* option). The resident portion of SuperSpool will be located immediately above the drive D: buffer. The spool buffer will be above the resident portion of SuperSpool. The user memory is pushed up above everything else, to the end of memory as indicated by the switch settings.

Figure 3-1 illustrates memory allocation in Example 1.

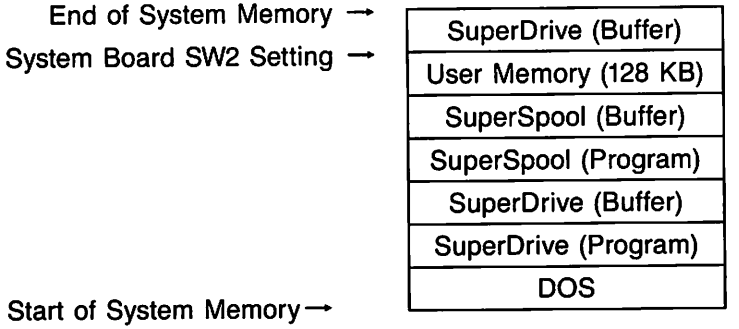


Figure 3-1. Memory Allocation (Example 1).

Example 2
You have a total of 576 KB of memory installed, with your system board switches set for 544 KB. You have two, double-sided floppies. You don't need SuperDrive this time, but you would like to use SuperSpool, and you want it to reside entirely in the memory above the switch settings so the full 544 KB will be available to your user program.

In this situation, the equation used in the first example no longer applies. Since there is 32 KB of memory above the switch settings, this is where the SuperDrive and/or SuperSpool programs will go first in allocating memory for their use. Through careful use of the */M = xxx* option, we can restrict the programs to reside entirely in that high memory.

The following command will put both the resident portion of SuperSpool and a 29-KB spool buffer into high memory.

SUPERSPL LPT1:/M = 29 <Enter>

Why 29 KB? To allow room for the SuperSpool program itself (we allowed 3 KB in this example). We don't need */U = xxx* this time since we are restricting the size and, therefore, the location of SuperSpool and its buffer.

A better, more efficient way to accomplish this is:

SUPERSPL LPT1:/M/DL<Enter>

SuperSpool should use every available byte of memory above the limit of the switch settings and is prevented from using any low memory by the */DL* option.

You could force both SuperDrive and SuperSpool to reside entirely above the limit of the system board switch settings. You could begin by using the */M=xxx* and */DL* options with SuperDrive, then use */M* and */DL* with SuperSpool. One way to verify that you have not inadvertently started using low memory is to use the CHKDSK command before and after the SuperDrive and/or SuperSpool commands. If the memory parameters (bytes free) are not identical before and after installing your SuperDrive and/or SuperSpool buffers, you have used up some of the low memory.

Figure 3-2 illustrates memory allocation in Example 2.

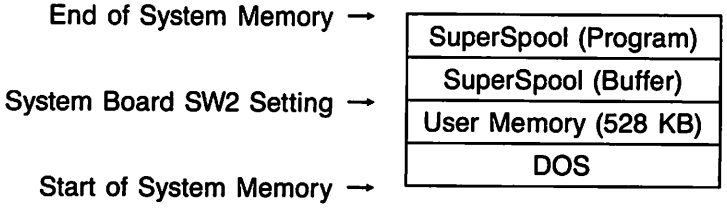


Figure 3-2. Memory Allocation (Example 2).

3.5 Using *RAMpage!* and RAMpage AT Expanded Memory

Adding a *RAMpage!* or RAMpage AT board to your computer can add up to 2 MB of *expanded* memory to your PC system (depending how much memory is on your board and how much of it is being used to round out the 640 KB of PC system (conventional) memory).

If you have configured some of your expanded memory as extended memory (that is, you have installed the REMM and REX programs), then you can use memory over 1 MB as data storage space for the SuperDrive, SuperSpool, and fAStdisk utilities. All the memory allocation options can be used in this configuration. You must use the */EXTM* option to enable use of expanded memory simulating extended memory by the SuperPak programs.

NOTE

If you are using IBM's VDISK or other programs that access *RAMpage!*/RAMpage AT *expanded* memory before the SuperPak utilities are initialized, AND you are planning to run the SuperPak utilities from *conventional* memory (0-640 KB, without the */EXTM* option), then you must include the */DNC* option in each SuperDrive, SuperSpool, and fASTdisk command to avoid conflicts with VDISK and other software.

3.5.1 The REMM and REX Device Driver Programs

In order for the SuperPak utilities to access expanded memory, the RAMpage Expanded Memory Manager (REMM) and RAMpage Extended Memory Emulator (REX) device driver programs must be installed on your PC. REMM allows applications software to use *RAMpage!* expanded memory. REX acts as an interface to software designed for use with PC-AT extended memory (such as the */EXTM* option for the SuperPak utilities), and allows it to use expanded memory by means of the REMM software.

The program files for both must be present on your boot diskette, and DEVICE commands to install each must be added to the CONFIG.SYS file section of DOS on your boot diskette. (CONFIG.SYS files are described in Section 2.3.) The DEVICE command to install REMM must precede the DEVICE command for REX.

The REX DEVICE command includes a parameter which indicates the maximum number of KB which can be used by programs (including the SuperPak utilities) accessing REX. The default value is 512 KB. This parameter must be large enough to include any expanded memory to be used by SuperPak utilities.

NOTE

Refer to the software installation section of your *RAMpage! User's Manual* or *RAMpage AT User's Manual* for information on REMM and REX installation.

The following table lists the file names and sample DEVICE commands for REMM and REX.

Table 3-1. REMM and REX Descriptions

Program Name	File Name	Sample DEVICE Command
REMM	REMM.SYS	DEVICE = REMM.SYS
REX	REX.SYS	DEVICE = REX.SYS 1024

If the commands in the table were used, then SuperPak utilities would be able to access a maximum of 1 MB of available expanded memory (provided by the parameter 1024).

3.5.2 Expanded Memory Allocation Example

EXAMPLE 1
This example shows how memory allocation could be accomplished with *RAMpage!* expanded memory. In this example, fASTdisk is running in the first 320 KB of expanded memory above 1 MB. SuperDrive and SuperSpool are also located in expanded memory above fAStdisk, from 1344 to 1700 KB. In this example, REMM and REX must be installed, and REX must be allocated at least 700 KB of memory.

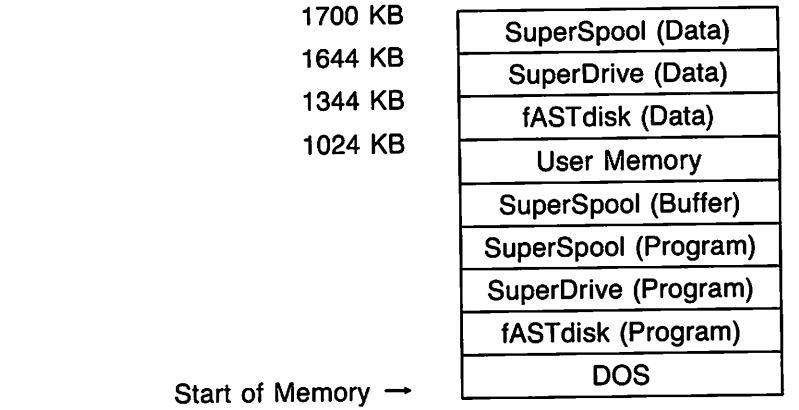


Figure 3-3. Expanded Memory Allocation (Example 1).

The commands used to achieve this memory allocation follow:

Enter the following command in the CONFIG.SYS file:

DEVICE = FASTDISK.SYS /EXTM/M = 320

Enter the following SuperSpool and SuperDrive commands:

SUPERDRV C: /M = 300
SUPERSPL LPT1:/M = 56

3.6 Using PC-AT Extended Memory

PC-AT memory at or above 1 MB is called *extended memory*. If you have an AST Research Advantage!™ board (with up to 3 MB of memory) or Ramvantage!™ board, then you may have extended memory. This memory can be enabled, by means of the */EXTM* option, for storing data for the SuperDrive, SuperSpool, and fASTdisk utilities. Some low memory is still needed by the utilities for storing resident program code and, for SuperSpool, an intermediate spooling buffer.

All the memory allocation options are available for use with PC-AT extended memory except */DNC* and */DH* (noncontiguous and high memory do not exist on a PC-AT).

Examples follow on how you can plan your memory allocation for the SuperPak utilities on a PC-AT.

3.6.1 Example of PC-AT Memory Allocation

In the following example, a 1.2 MB SuperDrive is created in extended memory. Above it, a SuperSpool buffer of 100 KB is located. The memory allocation is shown in the following diagram:

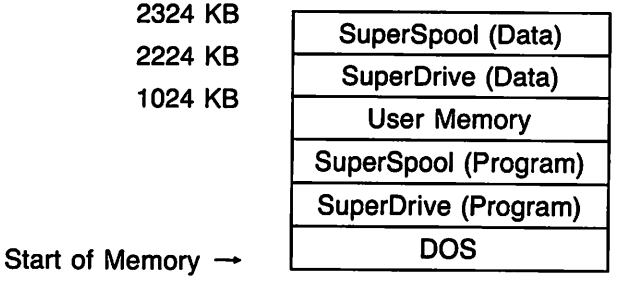


Figure 3.4 Extended Memory Allocation (Example 1).

Enter the following commands:

SUPERDRV C:/15/EXTM <Enter>
SUPERSPL LPT1:/M=100 <Enter>

No special device drivers need to be installed in order to access PC-AT extended memory.

SECTION 4

SUPERDRIVE

NOTE

The information contained in this section applies to SuperPak version 5.0 (or subsequent) and SuperDrive 1.40 (or subsequent). SuperDrive 1.40 (or later) is *not* compatible with the pre-1.40 SuperSpool program.

This section provides the optional parameters that can be used to modify the basic SUPERDRV command described in Section 2.4.4. These options are divided into the basic options used most often, and the less frequently used advanced options. In addition to command options, this section also includes examples, error messages, and application notes describing how to handle particular situations when using SuperDrive.

Before creating any SuperDrives using the options described here, you should read Section 2.4, "Getting Acquainted with SuperDrive", for background information such as how to prepare your PC, PC-XT, or PC-AT hardware for the creation of virtual diskette drives.

Table 4-1 summarizes the SuperDrive options presented in this section. It lists the beginning and advanced options that can be used in a SuperDrive command. It provides a brief description of each option's function and the section number where the option is discussed in detail.

Table 4-1. Summary of SuperDrive Options

	Option	Function	Section
Beginning Options	*/?*	Displays help screen with option descriptions.	4.1.1
	n:	Designates SuperDrive letter.	4.1.2
	/I	Inserts a SuperDrive between other diskette drives.	4.1.2
	/U	Reserves memory for use by other programs.	4.1.3
	/M	Limits memory allocation to SuperDrive.	4.1.3
	/EXTM	Enables use of expanded or extended memory by SuperDrive.	4.1.3
	/DEXTM	Disables use of expanded or extended memory by SuperDrive.	4.1.3
Advanced Options	*/1*	Creates a single-sided, 180-KB SuperDrive.	4.3.1
	/4	Creates a double-sided 360-KB SuperDrive (same as default), option format same as DOS 3.x	4.3.1
	/8	Changes number of sectors per track from 9 to 8.	4.3.2
	/15	Creates a 1.2 megabyte (MB) SuperDrive on a PC-AT.	4.3.2
	/TSIZE	Changes number of bytes of data transferred in and out of expanded/extended memory.	4.3.3
	/DH	Disables use of high memory by SuperDrive.	4.3.3
	/DL	Disables use of low memory by SuperDrive.	4.3.3
	/DMMGMT	Disables calls from SuperDrive to DOS memory management.	4.3.3

4.1 Basic SUPERDRV Command Options

The basic SUPERDRV command options are shown below, using the format notation described in Section 1.5.1:

SUPERDRV n:[/?][/I][/U = xxx][/M = xxx][/EXTM[= xxxx[,xxxx]]]
[/DEXTM] < Enter >

Note that each parameter except "n" is optional, and that each optional parameter (enclosed in brackets) is preceded by a slash (/). The optional parameters can be placed in any order after the colon (:). *Do not use spaces or commas to separate options.*

The SUPERDRV command invokes the SuperDrive program's command handler routines (SUPERDRV.COM must be resident on your Disk Operating System (DOS) diskette). The options shown in the command line above are described in the following subsections on configuring the drive and allocating memory to SuperDrive.

4.1.1 Help Option

[/?]

This option displays a help screen that lists the available options for the command line. Do not use this option in an AUTOEXEC file to install SuperDrive. Use the */?* option by itself to check on the available command options, in the following command form:

SUPERDRV /? < Enter >

4.1.2 Drive Configuration Options

n:

Denotes the drive to be simulated in random access memory (RAM) and is immediately followed by a colon. The only valid drive letters are A:, B:, C:, or D:.

[/I]

This option logically inserts a SuperDrive as drive *n:*. Any physical disk drive or SuperDrive currently defined as drive *n:* will be "pushed up" one drive position. For example:

SUPERDRV A:/I

defines SuperDrive as drive A: and causes the current drive A: (whether a SuperDrive or a floppy drive) to become drive B:, drive B: becomes drive C:, and so forth. Other drives which come logically after the inserted drive will also be pushed up one position. Remember that DOS will support only four drives (A:, B:, C:, and D:).

CAUTION

Do not configure a SuperDrive disk unit in place of a real physical drive without using the /I option, or you will not be able to access the real physical drive until the system is rebooted.

4.1.3 Memory Allocation Options

[/U = xxx]

This option reserves a minimum of xxx KB of memory for an applications program and its work space that the SuperDrive program will not use. This is the area of memory in which your applications program will run. For example, if the instructions to your word processing program say that it needs 128 KB to run, you would use a value of "/U = 128". If no */U = xxx* parameter is specified, SuperDrive will reserve a minimum of 64 KB for applications program use.

The value specified by */U = xxx* is only a minimum; there may be more available if you have not allocated all other memory to SuperDrive, SuperSpool and/or fASTdisk. After creating your SuperDrives, you can verify how much user memory is available by using the CHKDSK function.

If you are using the */U=xxx* option to reserve space for an applications program other than another SuperPak utility, you must use the exact same */U=xxx* parameter in all SuperDrive, SuperSpool, and fASTdisk command parameters. The value specified by the */U=xxx* option has priority over all other memory allocation.

You can use this option to reserve space for another SuperPak utility. If this is done, then the */U=xxx* parameter will be smaller in subsequent utility commands, since they will be using some of the space reserved in the first command.

[/M=xxx]

This option reserves xxx KB of memory for SuperDrive use. Your applications program does not use this memory. The */M=xxx* option is used to limit the size of your SuperDrive to less than the default amount appropriate for its drive configuration, but it cannot increase the size of your SuperDrive beyond the default.

By default, your SuperDrive will have a storage size of 360 KB, appropriate for its configuration. The */M=xxx* option can be used to create a SuperDrive smaller than 360 KB. (Different amounts of memory may be allocated by default if the advanced options */1*, */4*, and */15* discussed in Section 4.3 are used.)

The */M=xxx* option specifies the maximum amount of memory that will be allocated to the selected SuperDrive and can be used to to create multiple SuperDrives of specific capacities.

The actual amount of memory used for the SuperDrive will be slightly more than the value specified by */M=xxx*.

[/EXTM[=xxxx[,xxxx]]]

This option is available only on a PC-AT with extended memory, or when your computer has AST Research's *RAMpage!* or RAMpage AT expanded memory boards and *RAMpage!* software installed. This software includes the

RAMpage Expanded Memory Manager (REMM) and RAMpage Extended Memory Emulator (REX). (Refer to Section 3.5 for further information on using SuperPak with *RAMpage!*.)

This option enables use of available memory at or above 1 MB by SuperDrive. Memory in the first MB can also be used if necessary. Usually, */EXTM* is specified without any numeric fields, allowing your SuperDrive to use any available memory at or above 1 MB.

The amount of memory actually used by SuperDrive is determined by the drive configuration or the */M=xxx* option, whichever is smaller. The default drive configuration is 360 KB for each SuperDrive. (The default amount of memory allocated to SuperDrive may differ if the advanced drive configuration or sectors per track options described in Section 4.3 are used.)

Once you have used a form of the */EXTM* option with a fASTdisk, SuperDrive, or SuperSpool command, then that same option is automatically applied to any following SuperDrive, SuperSpool, or fASTdisk commands — UNLESS one of those commands disables use of the */EXTM* option with the */DEXTM* option.

To avoid possible conflicts with some applications programs, two numeric fields are provided to allow you to restrict the amount and range of expanded memory that SuperDrive can use. *The first field (four xs) represents the number of 1-KB blocks at or above 1 MB of memory that SuperDrive can use.* If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

The second field (four xs) indicates a starting offset for the portion of memory above 1 MB that SuperDrive can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

An offset can be specified to keep SuperDrive from conflicting with other software using memory above 1 MB, such as IBM's VDISK. No such conflict occurs between SuperDrive and SuperSpool or between SuperDrive and fASTdisk.

If VDISK is operating in extended memory, then you should always place the memory used by SuperDrive after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all of the remaining memory is to be available for use by fASTdisk, SuperDrive, and SuperSpool, then the parameter specified should be /EXTM=0,1824 (since 1024 + 800 = 1824).

[/DEXTM]

Once the */EXTM* option has been invoked in a previous command, this option can be used to disable use of expanded/extended memory in the command it appears in. Once it has been used, */EXTM* enables expanded/extended memory use in any subsequent commands that do not include */DEXTM*.

4.2 Basic SuperDrive Examples

The following examples demonstrate how to use the SUPERDRV command (for a step-by-step example of how to create and use SuperDrive, see Section 2.4).

The first three examples assume the user has two floppy drives (physical drives A: and B:); is running a PC with either a 64-KB system board or a 256-KB system board and DOS 2.0 or later; has set his system board switches for a total of four floppy drives; and has sufficient memory to successfully execute the commands without error (Section 4.6 discusses SuperDrive error messages).

Example 1

In the following example, the first command adds one double-sided SuperDrive as drive B:. SuperDrive B: replaces physical drive B:. Physical drive B: is no longer accessible.

The second command causes drive C: to become a double-sided SuperDrive. By default, each SuperDrive is allocated 360 KB of memory. A total of 64 KB of memory is allocated for an applications program.

SUPERDRV B:<Enter>
SUPERDRV C:<Enter>

Example 2
The following command allocates a minimum of 64 KB of memory for an applications program. It inserts a double-sided, 360-KB SuperDrive as drive A:. Physical drive A: becomes drive B:. Physical drive B: becomes drive C:. This command cannot be used in an AUTOEXEC file.

SUPERDRV A:/I<Enter>

Example 3
In this example, the first command inserts an 80-KB double-sided SuperDrive as drive B:. Physical drive B: becomes drive C:. The second command adds drive D: with 100 KB of capacity in double-sided format. The same */U=xxx* parameter must be used in each command, allocating a total minimum of 128 KB of memory for an applications program.

SUPERDRV B:/I/U=128/M=80<Enter>
SUPERDRV D:/U=128/M=100<Enter>

SUPERDRIVE EXAMPLES USING EXPANDED/EXTENDED MEMORY

The following examples use the */EXTM* option. This option is provided for use in systems with over 1 MB of extended memory, or *RAMpage!*/RAMpage AT expanded memory.

Example 4
The following command enables SuperDrive to use memory above 1 MB. It creates (by default) a double-sided SuperDrive C: with 360 KB of memory.

SUPERDRV C:/EXTM<Enter>

Example 5
The following command enables SuperDrive to use 200 KB of memory above 1 MB. The command creates a double-sided, 360-KB drive C:, which will use 160 KB of memory below 1 MB to provide the remaining memory needed for the SuperDrive.

SUPERDRV C:/EXTM = 200 <Enter>

Example 6
In this example, the first command enables SuperDrive to use 400 KB of memory above 1 MB, starting at an offset of 1824 KB. It defines a 300-KB drive by use of the */M* parameter. The 300-KB drive is allocated entirely within memory above 1 MB.

The second command initiates SuperSpool and also uses memory above 1 MB. Since only 400 KB of memory above 1 MB can be used, SuperSpool will look for 100 KB of memory from the first 1 MB for use as part of the 200 KB of storage allocated by the SUPERSPL command.

SUPERDRV C:/EXTM = 200,1824/M = 300 <Enter>
SUPERSPL LPT1:/M = 200 <Enter>

4.3 Advanced SUPERDRV Command Options

The entire SUPERDRV command follows. The advanced options are highlighted in color and shown in the order in which they are described.

SUPERDRV n:[/?][I][/U = xxx][/M = xxx][/EXTM[= xxxx[,xxxx]]][/DEXTM]
[/1][/4][/8][/15]
[/TSIZE = xxxx][/DH][/DL][/DNC][/DMMGMT] <Enter>

The SUPERDRV command is actually entered on one continuous line which may wrap around to a second line. (Options are shown on several lines here to indicate option groupings.)

You can use the advanced SUPERDRV command options to create special drive configurations such as single-sided drives; to vary the number of sectors per track so as to create the 1.2 MB drives used on the PC-AT; to disable use of low, high, and noncontiguous memory, and DOS memory management on PCs with special types of memory configurations.

4.3.1 Advanced Drive Configuration Options

[/1]

This option creates a single-sided drive. Under DOS 2.0 and 2.1, the default size for a single-sided drive is 180 KB. To specify a nonstandard capacity, see the */M=xxx* option in Section 4.1.3.

[/4]

This option can be entered on any PC. It creates a standard double-sided drive with a default size of 360 KB. This option provides compatibility with the DOS 3.x FORMAT command.

4.3.2 Sectors Per Track Options

[/8]

This option specifies 8 sectors per track. If this option is omitted, a value of 9 sectors per track will be used.

[/15]

This option specifies 15 sectors per track and configures the drive to create a high-density drive with 1.2 MB of memory, using 15 sectors per track and 80 tracks. DOS will recognize a 1.2 MB high density drive only on a PC-AT using DOS 3.x or later.

4.3.3 Advanced Memory Management Options

*[/TSIZE=*xxxxx]

This option is used only when part of the SuperDrive is in memory at or above 1 MB (when the /EXTM option described in Section 4.1.3 has been used). The TSIZE

option sets the maximum number of bytes of data that can be transferred in and out of memory above 1 MB at a time. You can supply any value from 16 bytes to 32,000 bytes (32 KB) with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 by SuperDrive to yield the actual transfer size, so it is advisable to supply a multiple of 16.

This option may affect interrupt handling since interrupt handling may be suspended while data transfers take place. If interrupts are being lost, then TSIZE should be decreased.

The following options are for users who have memory installed in their computer which is above the amount for which their system board switches are set (expanded, extended, or high memory), or for users who have noncontiguous memory at hexadecimal address :C0000 or higher.

[/DH]

This option (Disable High-Memory Use) prevents SuperDrive from using any portion of contiguous memory which might be available above the limit set by the system board switches. (Only PCs with 64 or 256 KB installed on the system board have high memory.) It does not, however, prevent them from using any noncontiguous memory which may be present beginning at hexadecimal address :C0000, or from using memory available below the switch settings. It has no effect if there is no contiguous memory available above the switch settings.

[/DL]

This option (Disable Low-Memory Use) prevents SuperDrive from using any portion of user memory; that is, contiguous memory below the limit set by the system board switches. It restricts them to using only memory available above the switch settings. If noncontiguous

memory is available beginning at hexadecimal address :C0000, it is used first. This implies that there must be memory available above the switch settings in order to use this option.

[/DNC]

This option (Disable Noncontiguous Memory Use) prevents SuperDrive and SuperSpool from using any noncontiguous memory which may be available beginning at hexadecimal address :C0000.

[/DMMGMT]

This option (Disable Memory Management) disables calls to DOS memory management. Normally the SuperDrive program will call DOS memory management in an attempt to acquire any additional, unused memory. Using */DMMGMT* prevents SuperDrive from acquiring additional memory from DOS.

You would use this option to ensure that SuperDrive does not use any unallocated memory that you may want to subsequently allocate to other programs. DOS memory management does not allocate high- or noncontiguous memory. Section 10, "DOS Memory Management", of the IBM *DOS Manual* (version 2.10 or later) provides further information on the DOS memory management calls.

4.4 Advanced SuperDrive Examples

The following examples combine some of the basic options described in Section 4.1 with several of the advanced options listed in this section.

Example 1

The following command allocates a minimum of 64 KB of memory (by default) for applications program. It also adds one single-sided SuperDrive as drive C:.

SUPERDRV C:/1 <Enter>

Example 2
The following command allocates a minimum of 256 KB for applications program memory. It creates a single-sided, 100-KB SuperDrive as drive C:. It also restricts SuperDrive from using any contiguous memory which may be available above the limit set by the switch settings.

SUPERDRV C:/1/U=256/M=100/DH<Enter>

Example 3
The following command allocates a minimum of 320 KB for applications program memory. It creates a double-sided SuperDrive as drive C:. It also prevents SuperDrive from using any part of contiguous memory below the setting of the system board switches.

SUPERDRV C:/2/U=320/DL<Enter>

Example 4
In the following example, the first command allocates a minimum of 64 KB for applications program memory. It also creates a single-sided, 100-KB SuperDrive as drive C:.

The second command creates a double-sided (by default), 50-KB SuperDrive as drive D:. It prevents SuperDrive from using any noncontiguous memory (if there is any available) and prevents it from using any contiguous memory available below the switch settings. This implies that there must be sufficient contiguous memory available above the switch settings (high memory) to successfully perform both of these commands.

SUPERDRV C:/1/M=100/DL/DNC<Enter>
SUPERDRV D:/M=50/DL/DNC<Enter>

Example 5
In the following example, the first command allocates a minimum of 384 KB of memory for applications program memory. It creates a standard, single-sided SuperDrive as drive B:, located in noncontiguous memory. Physical drive B: is no longer accessible.

The second command creates a single-sided SuperDrive as drive C: located in noncontiguous memory, whose size will be whatever is left over there from the previous command (around 30 KB when the maximum 192 KB was available).

The third command creates a standard, single-sided SuperDrive as drive D:. Since noncontiguous memory has been exhausted from the previous two commands, drive D: will be located in contiguous memory above the switch settings of the system board.

```
SUPERDRV B:/1/U=384/DH/DL<Enter>
SUPERDRV C:/1/U=384/DH/DL<Enter>
SUPERDRV D:/1/U=384/DL<Enter>
```

Example 6
The following command creates a double-sided SuperDrive B: (the disk size defaults to the standard 360-KB disk size), reserves 256 KB for the applications program, and disables calls to DOS memory management.

```
SUPERDRV B:/2/U=256/DMMGMT
```

4.5 SuperDrive Application Notes

Some suggestions follow for how to use SuperDrive to the best advantage in certain situations. For example, using SuperDrive with overlay software and using SuperDrive on a single drive PC.

A crucial fact to remember when using SuperDrive is that since any data stored on a SuperDrive is actually stored in RAM, it will be lost if there is a power failure or whenever you turn the computer off or reboot the system. Only noncritical files should be stored on a SuperDrive disk drive. This protects you in the event of a power outage.

4.5.1 Using SuperDrive with Overlay Software

One of the most common and useful applications of SuperDrive uses the electronic disk to store multipart applications programs which use "overlays". For example, if your applications software is menu-driven or option-oriented, it probably consists of several different programs, each corresponding to an option. When you choose an option, the appropriate program is loaded into RAM from disk. Word processing programs are excellent examples of overlay software. Switching between options, menus, formats, or other logical program divisions can be a time consuming "wait for the disk drive" experience.

By copying such programs to a SuperDrive disk and executing them from SuperDrive, the transition time between the various options becomes virtually unnoticeable. We recommend that you store your data files directly to a floppy diskette in case of power failure. This gives you maximum speed while maintaining maximum data integrity.

4.5.2 Protecting Important Data Files

If you do elect to store data files on a SuperDrive, you may want to execute your applications program from an AUTOEXEC.BAT (also referred to as AUTOEXEC) file such as the one illustrated below. We suggest you add a command to the AUTOEXEC file immediately following the command to run your program, which will transfer (COPY) your data file(s) from the SuperDrive back over to a floppy. Thus, as long as you take an orderly exit from your program back to DOS, the AUTOEXEC file will automatically take control and copy your data files to a floppy diskette.

For example, let's say your program and data files are all contained on drive A: and you want to run this program on a SuperDrive as drive C:, modify the data file also on drive C:, exit to DOS when finished, and have your data file copied back to floppy drive A:. The AUTOEXEC file on your DOS diskette in drive A: might look like this:

ASTCLOCK
SUPERDRV C:
COPY A:*.* C: (copy all files from drive A: to drive C:)
C:
[name of applications program to run from drive C:]
COPY C:*.* A: (copy all files from drive C: to drive A:)

Now, when you exit your applications program and return to DOS, everything on the SuperDrive disk (drive C: in our example) will automatically be copied to your floppy diskette in drive A:.

4.5.3 Creating SuperDrive A: from an AUTOEXEC File

DOS will not let you create a SuperDrive as drive A: from an AUTOEXEC file. However, you can circumvent this problem. The following two batch files illustrate how to do this. Again, this assumes you have two physical drives, A: and B:. A number of other commands have been included to illustrate what you can do with batch files. For convenience, the exact keyboard commands to use when creating these two batch files are included.

COPY CON: AUTOXEC.BAT <Enter>
RAMCLEAR <Enter>
ASTCLOCK <Enter>
MODE LPT1: <Enter>
B: <Enter>
MAKE-A <Enter>
<F6> <Enter>

This file resides on the diskette in drive A: the boot diskette) at the time the system is booted.

COPY CON: MAKE-A.BAT <Enter>
SUPERDRV A:/I <Enter>
SUPERSPL LPT1: <Enter>
COPY B:*.* A: <Enter>
A: <Enter>
[command to execute applications program from A:] <Enter>
<F6> <Enter>

This file resides on the diskettes in both drives A: and B: at the time the system is booted.

This method requires that, at boot time, the diskette in drive A: contains all of the programs that you want to execute from the SuperDrive drive A:, and that both drives A: and B: contain the above file MAKE-A.BAT. The diskette in drive B: contains SuperDrive and SuperSpool.

4.5.4 Single-Drive Systems

If you have only one physical drive but your system board switches are set for two or more drives and you wish to use the DISKCOPY command to copy a floppy diskette, be sure to specify drive A: as both the source and target diskette (**DISKCOPY A: A:**). You can, of course, DISKCOPY to and from a SuperDrive if it is the same size as your physical drive A:.

If you want to use the COPY command to move files from one diskette to another, you will have to use the command in conjunction with SuperDrive. COPY the file(s) you want to transfer from drive A: to SuperDrive B:, insert the actual destination diskette in drive A:, and COPY back from drive B: to drive A:.

4.5.5 Using DOS Commands with SuperDrive

When you create a SuperDrive, you should think of it as a formatted data disk, without DOS installed on it. The process of creating the SuperDrive automatically formats the SuperDrive so that you do not need to execute a DOS FORMAT command as a separate operation.

All other DOS commands will function on a SuperDrive just as they do on a real floppy drive. However, you can use the DISKCOPY command only if your floppy diskette and your SuperDrive are identical in size. If you have single-sided drives, you will not be able to use the DISKCOPY command to copy double-sided diskettes. However, you can use double-sided drives to DISKCOPY single-sided diskettes.

You can perform simple DOS commands in between creation of multiple SuperDrives. For example, you can use the following command sequence:

```
SUPERDRV A:/I
COPY B:*.* A:
SUPERDRV B:/I
COPY D:*.* B:
```

You should not execute applications programs in between creation of multiple SuperDrives.

4.5.6 SuperDrive Compatibility

As a general rule, if the program you want to use with SuperDrive will allow itself to be copied to a floppy drive, it can also be copied to and executed from a SuperDrive. If, on the other hand, your program is currently stored on a copy-protected diskette, you will probably not be able to use it with SuperDrive.

If your program is currently executed from an AUTOEXEC file on a boot diskette, and you want to modify it to run with SuperDrive, you will have to modify the AUTOEXEC file. (See Appendix D for instructions on how to modify an AUTOEXEC file.) You need to place your SuperPak commands BEFORE your program commands in the AUTOEXEC file in order for the programs to use the SuperPak utilities.

Some programs insist upon accessing a specific drive even though the default drive has been changed to something else. If this is the case for your program, you will have to configure your SuperDrive(s) to be the same designation as that which the program expects.

4.6 Error Messages

SuperDrive gives you an error message under certain conditions. These messages are described below.

INVALID DRIVE SPECIFICATION....ABORTING

Explanation: This message indicates that either the system board switches were not set for the correct number of drives (see Section 2.4), or you used an invalid drive letter in your SuperDrive command.

INSUFFICIENT MEMORY....ABORTING

Explanation: This message indicates that there is insufficient, unallocated memory available in the system to create a SuperDrive of any size.

SHORT xxxxxx BYTES

Explanation: This is not really an error message. It indicates that the SuperDrive you have just created is less than a standard sized drive in size. This could happen if you use the */M=xxx* option to create a nonstandard drive, or if there were some memory available, but not quite enough to make the drive exactly the size you specified.

If you receive an error message other than those above while trying to initialize SuperDrive, it may be a DOS error message described in your *DOS Technical Reference Manual*.

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SECTION 5

SUPERSPOOL

NOTE

The information contained in this section applies to SuperPak version 5.0 (or subsequent) and SuperSpool 1.40 (or subsequent). SuperSpool 1.40 (or later) is *not* compatible with the pre-1.40 SuperDrive programs. DOS 2.0 or later must be used with this version of SuperPak. SuperPak 5.0 does not support DOS 1.x.

This section provides the options that can be used to modify the basic SUPERSPL command described in Section 2.5. These options are divided into the basic options used most frequently, and the less frequently used advanced options. In addition to the command options, this section also includes example command forms and application notes describing how to handle particular situations when using SuperSpool.

Before initiating SuperSpool with one of the command forms described in this section, be sure to peruse Section 2.5, "Getting Acquainted with SuperSpool, for essential background information such as how to enter a PC-DOS MODE command before each SuperSpool session.

The SUPERSPL command options vary depending on the type of printer (serial or parallel) to which you are sending output.

Table 5-1 summarizes the options presented in this section. It lists the beginning and advanced options that can be used in a SuperSpool command. Except where noted, these options apply to both parallel and serial printers.

Table 5-1. Summary of SuperSpool Options.

	Option	Function	Section
Beginning Options	*/?*	Displays help screen with option descriptions.	5.1.1
	LPTn:	Selects one of three parallel ports.	5.1.2
	COMn:	Redirects parallel printer output to a serial port (serial printer only).	5.1.2
	/U	Reserves memory for use by another program.	5.1.3
	/M	Varies the default (64 KB) memory allocation to the SuperSpool buffer.	5.1.3
	/EXTM	Enables use of expanded or extended memory by SuperSpool.	5.1.3
	/DEXTM	Disables use of expanded or extended memory in the current command.	5.1.3
	/Rate, parity, databits, stopbits	Sets serial printer configuration parameters (serial printer only).	5.1.4
	/ON,/OFF	Turns on and off port line protocol options. (serial printer only).	5.1.4
Advanced Options	*/TSIZE*	Varies the number of bytes of data transferred in and out of expanded or extended memory at a time.	5.3.1
	/DH,/DL, /DNC	These options disable use of high, low, or noncontiguous memory, respectively.	5.3.1
	/DMMGMT	Disables DOS memory management calls.	5.3.1
	/DBI	Disables the Block Transfer Interface.	5.3.2
	/LPP	Sets number of lines per page.	5.3.3
	/FF	Sends formfeed to printer.	5.3.4
	/STRING	Sends characters to printer.	5.3.4
	/S,/C	Stops and continues output of print data, respectively.	5.3.4
	/P	Purges all data from the SuperSpool buffer.	5.3.4
	/B,/R,/RP	Page reprint options.	5.3.5
	/PINT	Changes the default IRQ (parallel printer).	5.3.6
	/SINT	Changes the default IRQ (serial printer).	5.3.7

5.1 Basic SUPERSPL Command Options

The basic options available for the SUPERSPL command are shown in the following command lines, one for parallel printers and one for serial printers. The format notation used in the command line is explained in Section 1.5.1. (More advanced options are provided later in this section.)

The basic SUPERSPL command options for a parallel printer are as follows:

```
SUPERSPL LPTn:[/?][/U=xxx][/M[=xxx]]
              [/EXTM[=xxxx[,xxxx]]][/DEXTM]<Enter>
```

The basic SUPERSPL command options for a serial printer follow:

```
SUPERSPL LPTn:=COMn:[/?][/RATE=xxxx[,parity[,databits[,stopbits]]]]
              [/U=xxx][/M=xxx][/EXTM[=xxxx[,xxxx]]][/DEXTM]
              [/ON=option][/OFF=option]<Enter>
```

The parameters shown surrounded by brackets ([]) are optional and can be entered in any order. Each option shown in brackets begins with a slash (/); do not use commas or spaces to separate options. You should enter a command by typing on one line which may wrap around to a second line. (Options are shown on several lines here to indicate option groupings.)

The basic SUPERSPL command options shown above allow you to modify the output port, allocate memory, and configure a serial printer for use with SuperSpool. A description of each option follows.

5.1.1 Help Option

The Help (/?) option can be used with the SUPERSPL command to display the valid options that can be used as part of the command line. It is used by itself to gather information; it does *not* operate SuperSpool.

Use the following SUPERSPL command for a parallel or serial printer:

SUPERSPL /? <Enter>

5.1.2 Redirect Output Options

The IBM PC normally sends all printer output to LPT1 unless you redirect the output to a different port. When either a serial or parallel port is assigned for printer output with SuperSpool, that port cannot be used by any other program for any purpose until you use another SuperSpool redirection command such as COMn to "release" the port.

For a parallel printer:

LPTn:
Selects one of the three possible parallel ports: LPT1, LPT2, or LPT3. Note that your version of DOS may not allow normal parallel output to any port other than LPT1.

For a serial printer:

LPTn: = COMn:
Redirects parallel printer output to a serial port. COM1 and COM2 are the only valid serial ports. LPTn now responds as LPTn + 1 (LPT1 becomes LPT2, and so forth). This SuperSpool command replaces the DOS MODE command for redirecting output from the parallel port LPT1 to serial port COM1 or COM2. (You must still use the MODE LPT1: command at the start of every computing session before any SUPERSPL command is issued.)

5.1.3 Memory Allocation Options

[/U = xxx]
This option prevents SuperSpool from using *all* memory for a print buffer by reserving a minimum of xxx KB of memory for the applications program and its work space. If you do not use the */U = xxx* option, SuperSpool reserves a minimum default applications program space of 64 KB. SuperSpool will not interfere with this memory.

If you use the */U=xxx* option with the SUPERSPL command to reserve space for an applications program other than a SuperPak utility, you must use the exact same parameter in your SUPERDRV and fASTdisk commands. This parameter is a total and is not incremented with each additional command.

If on occasion you use the */U=xxx* option to reserve space for another SuperPak utility, then the allocation in different utility commands will be for different amounts.

*[/M[=*xxx*]]*

This option allocates xxx KB of memory to SuperSpool for use as a print buffer. If you do not use the */M=xxx* option, the buffer size defaults to 64 KB. Using spool buffers of less than 4 KB is not recommended for efficient operation.

If this option is specified without a numeric parameter (/M), *all* remaining available memory that has not been reserved for applications program space (/U), SuperDrive(s), or for DOS itself will be allocated to the spool buffer. This is a powerful option because it allows for absolutely no wasted memory space after making the other necessary memory allocations.

A SUPERSPL command using the */M* option probably will not leave enough memory for other driver-type programs to load successfully. Therefore, the other drivers should be loaded before SuperDrive and SuperSpool, or space can be reserved using the */U=xxx* parameter.

*[/EXTM[=*xxxx*[,*xxxx*]]]*

This option is available only on a PC-AT with extended memory, or when your computer has AST Research's *RAMpage!* or RAMpage AT expanded memory boards and *RAMpage!* software installed. This software includes the RAMpage Expanded Memory Manager (REMM) and RAMpage Extended Memory Emulator (REX). (Refer to Section 3.5 for further information on using SuperPak with *RAMpage!*.)

This option enables use of available memory at or above 1 MB by SuperSpool. Memory in the first MB can also be used if necessary. Usually, */EXTM* is specified without any numeric fields, allowing SuperSpool to use any available memory at or above 1 MB. The amount of memory actually used by SuperSpool is determined by the */M=xxx* option or the default of 64 KB.

Once you have used a form of the */EXTM* option with a fASTdisk, SuperDrive, or SuperSpool command, then that same option is automatically applied to any following SuperDrive, SuperSpool, or fASTdisk commands — UNLESS one of those commands temporarily disables use of the */EXTM* option with the */DEXTM* option.

To avoid possible conflicts with some applications programs, two numeric fields are provided to allow you to restrict the amount and range of expanded memory that SuperDrive can use. *The first field (four xs) represents the number of 1-KB blocks at or above 1 MB of memory that SuperDrive can use.* If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

The second field (four xs) indicates a starting offset for the portion of memory above 1 MB that SuperDrive can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

An offset can be specified to keep SuperDrive from conflicting with other software using memory above 1 MB, such as IBM's VDISK. No such conflict occurs between SuperDrive and SuperSpool or between SuperDrive and fASTdisk.

If VDISK is operating in extended memory, then you should always place the memory used by SuperDrive after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all of the remaining memory is to be available for use

by fASTdisk, SuperDrive, and SuperSpool, then the parameter specified should be /EXTM = 0,1824 (since 1024 + 800 = 1824).

[/DEXTM]

Once the */EXTM* option has been invoked in aprevious command, this option can be used to disable use of expanded/extended memory (only in the command(s) it appears in.)

5.1.4 Serial Printer Configuration Options

When using SuperSpool with a serial printer, these SuperSpool options replace the equivalent MODE command for Baud rate, parity, data bits, and stop bits:

[/RATE = xxxx]

This option sets the Baud rate of the selected serial communications adapter (110, 150, 300, 600, 1200, 2400, 4800, or 9600). There is no default for this parameter, except what has been previously set for the printer, for instance by the DOS MODE command.

[,parity]

Parity is either N (None), O (Odd), or E (Even). Default is Even.

[,databits]

Either 7 or 8. Default is 7.

[,stopbits]

Either 1 or 2. If /RATE = 110, the default is 2; otherwise, the default is 1.

[/ON = option, . . .] [/OFF = option, . . .]

This option is used to turn on and off certain serial printer port line protocol options. Output to a serial printer occurs only when all SuperSpool printer output conditions have been met. This applies to XON/XOFF, DCD, DSR, and CTS.

Data set line conditions are determined by the state of the signals DCD, DSR, and CTS. You can make SuperSpool ignore all data set line conditions with this command:

/OFF = DCD,DSR,CTS,XON

You can enable any or all of these lines with a similar "/ON = option(s)" command. Whether you use the /ON and /OFF options depends on the internal configuration of your serial printer and its cabling to the PC. XON/XOFF is enabled by "/ON = XON" and disabled by "/OFF = XON".

The default condition of the data set line conditions is CTS and DSR ON. That is, SuperSpool must see them ON before it will output data to the printer. DCD and XON/XOFF are OFF (ignored).

Consult your printer manual for information on its particular requirements in all the above serial options. Also check the AST Research product user's manual for further information.

5.2 Basic SuperSpool Examples

The following examples illustrate how to use the basic forms of the SUPERSPL command.

5.2.1 Parallel Printer Examples

Example 1
The following command spools printer output to LPT1. It reserves a minimum of 192 KB for the applications program in the first MB of memory. It also enables memory above 1824 KB for the spool buffer, as indicated by the */EXTM* option. The */M* option indicates that all remaining available memory will be used by SuperSpool.

SUPERSPL LPT1:/U = 192/M/EXTM = 0,1824 < Enter >

Example 2
In the following example, the first command uses a total of 100 KB of memory above 1 MB to create a SuperDrive B that is double-sided but not a full 360 KB.

The second command spools printer output to LPT1. It enables memory above 1 MB for allocation to SuperSpool. Since no allocation of memory to SuperSpool or an applications program is made, it reserves by default 64 KB for an applications program and 64 KB for the spool buffer.

SUPERDRV B:/EXTM/M = 100 <Enter>
SUPERSPL LPT1: <Enter>

5.2.2 Serial Printer Examples

In each of the following serial printer examples, the LPTn port being redirected to COMn becomes LPTn + 1 after activating SuperSpool. (For example, LPT1 responds as LPT2 and LPT2 becomes LPT3.) The SuperSpool redirection command replaces the equivalent DOS MODE commands for serial printers.

Example 1
The following command spools printer output to serial port COM2 (redirected from LPT1) at 110 Baud, even parity, 7 data bits, 2 stop bits. It reserves a minimum of 128 KB for the applications program. It also reserves 16 KB for use as the spool buffer.

SUPERSPL LPT1: = COM2:/RATE = 110,E,7,2/U = 128/M = 16 <Enter>

Example 2
The following command spools printer output to serial port COM1 (redirected from LPT1) at 300 Baud, no parity, 8 data bits, 1 stop bit. It monitors the XON code from the printer to determine when data can be sent to it, and ignores the DCD, DSR, and CTS lines. It reserves a minimum of 320 KB for the applications program. It also uses all remaining available memory for the spool buffer.

SUPERSPL LPT1: = COM1:/RATE = 300,N,8,1/ON = XON/OFF = DCD,DSR,CTS /U = 320/M <Enter>

5.3 Advanced SUPERSPL Command Options

The entire SUPERSPL commands for a parallel printer and for a serial printer, are shown here. The advanced options are highlighted in color and shown in the order in which they are described in this section.

The entire SUPERSPL command when output is to a parallel printer port (LPTn) is as follows:

```
SUPERSPL
    LPTn:[/?][/U=xxx][/M[=xxx]][/EXTM[=xxxx[,xxxx]]][/DEXTM]
         [TSIZE=xxxxx][/DH][/DL][/DNC][/DBI][/DMMGMT][/LPP=xx]
         [/FF][/STRING=xxx[,xxx,...]][/S][/C][/P]
         [/B][/R][/RP][/PINT[=X]]<Enter>
```

When output is to a serial printer with a serial port (COMn), the complete SUPERSPL command is as follows:

```
SUPERSPL
    LPTn:=COMn:[/?][/RATE=xxxx[,parity[,databits[,stopbits]]]]
         [/U=xxx][/M=xxx][/EXTM[=xxxx[,xxxx]]][/DEXTM]
         [/ON=option][/OFF=option]
         [/TSIZE=xxxx][/DH][/DL][/DNC][/DBI][/DMMGMT][/LPP=xx]
         [/FF][/STRING=xxx[,xxx,...]][/S][/C][/P]
         [/B][/R][/RP][/SINT[=X]]<Enter>
```

You can use the advanced SUPERSPL command options to accomplish the following tasks:

- Disable the use of low, high, and noncontiguous memory.
- Disable DOS memory management.
- Disable the block transfer interface.
- Set the number of lines per page.
- Perform selected actions while printing.
- Change the IRQ number for a printer.

5.3.1 Advanced Memory Management Options

[/TSIZE = xxxxx]

This option is used only when part of the SuperSpool is in memory at or above 1 MB (when the /EXTM option has been used). The TSIZE option sets the maximum number of bytes of data that can be transferred in and out of memory above 1 MB at a time. You can supply any value from 16 bytes to 32,000 bytes (32 KB) with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 by SuperSpool to yield the actual transfer size, so it is advisable to supply a multiple of 16.

This option may affect interrupt handling since interrupt handling may be suspended while data transfers take place. If interrupts are being lost, then TSIZE should be decreased.

The following options are for users who have their system board switches set for less memory than what is actually installed in the computer, or for users who have noncontiguous memory at hexadecimal address :C0000 or higher.

[/DH]

This option (Disable High-Memory Use) prevents SuperDrive and SuperSpool from using any portion of user memory; that is, contiguous memory which might be available above the limit set by the system board switches. It does not, however, prevent them from using any noncontiguous memory which may be present beginning at hexadecimal address :C0000 and up, or from using memory available below the switch settings. It has no effect if there is no contiguous memory available above the switch settings.

[/DL]

This option (Disable Low-Memory Use) prevents SuperDrive and SuperSpool from using any portion of contiguous memory below the limit set by the system board switches. It restricts them to memory available above the switch settings. If noncontiguous memory is available beginning at hexadecimal address :C0000, it is used first. This implies that there must be memory available above the switch settings in order to use this option.

[/DNC]

This option (Disable Noncontiguous Memory Use) prevents SuperDrive and SuperSpool from using any noncontiguous memory which may be available beginning at hexadecimal address :C0000. If contiguous memory is available above the limit set by the switch settings, it is used first.

[/DMMGMT]

This option (Disable Memory Management) disables calls to DOS memory management. Normally the SuperDrive and SuperSpool programs will call DOS memory management in an attempt to acquire any additional, unused memory. Using */DMMGMT* prevents those programs from acquiring additional memory from DOS.

You should use this option to ensure that SuperDrive or SuperSpool do not use any unallocated memory that you may want to subsequently allocate to other programs. DOS memory management does not allocate high or noncontiguous memory. Section 10, "DOS Memory Management" of the IBM *DOS Manual* (version 2.10) provides further information on the DOS memory management calls.

5.3.2 Disabling the Block Transfer Interface

[/DBI]

This option (Disable Block Transfer Interface) disables the block transfer interface that allows easier interface between SuperSpool and other applications software. You can disable this interface to avoid a conflict if your application software uses interrupt vector INT 58 hexadecimal.

5.3.3 Printer Format Option

[/LPP = xx]

This option sets the number of lines per page. The default is 66. Please note that SuperSpool does not automatically page your documents for you. The LPP option is used in conjunction with formfeed characters sent to the printer by your software to control paging.

5.3.4 Printer Control Options

You can invoke the following Printer Control options from DOS while spooling is taking place to control the printer and the spool buffer output. They can be used to query the spool status and stop the printout among other functions. If your printer has its own internal input buffer, some of the commands may take some time to take effect as the printer empties its own internal buffer.

[/FF]

This option sends a formfeed character to the printer.

[/STRING = xxx[,xxx, . . .]]

This option sends a series of characters to the printer, which will be translated by the printer according to its character translation code, and then printed. This option may be used to send a printer initialization character string to the printer. Up to 60 decimal numbers, separated by commas, can be entered. These numbers are converted to characters for transmission to the printer.

[/S]

This option stops output of print data. No data will be lost, and you can restart data transmission at any time by using the SUPERSPL/C command.

[/C]

This option continues output of print data, if previously stopped by the SUPERSPL/S command.

[/P]

This option immediately purges (empties) all data from the SuperSpool print buffer.

5.3.5 Page Reprint Options

The /B, /R, and /RP options are used in combination to provide the ability to reprint a page after the printer has been stopped with the /S option. The /B option enables the /R and /RP options. Do not combine the /B option with the /R or /RP options in the same line. The /B option is to be used when first initializing your spool buffer. The /R and /RP options are for use only after printing has already begun.

[/B]

This option enables the /RP and /R options (which are explained below). It is recommended that you specify the /B option only when the spool buffer is at least 16 KB in size. Additional buffer space is used to "save" the extra page or two of print data and, in smaller buffer configurations, could consume all available spool buffer space.

[/R]

This option causes the printer output to be restarted at the beginning of the current page, if enabled by a SUPERSPL/B command.

[/RP]

This option causes the printer output to be restarted at the beginning of the previous page, if enabled by the SUPERSPL/B command.

NOTE

The /B option is designed for use with text that contains the formfeed and linefeed characters at the appropriate intervals, and does not operate correctly if the formfeed and linefeed characters are not output to the printer.

If the */B* option has been previously selected, SuperSpool will monitor the printer output data stream for formfeed (go to the top of the next page) and linefeed (go to the next line) characters. A formfeed character determines the top of page, while a linefeed character specifies the end of a line and can also be used, by counting the number of linefeeds per page, to determine the top of page.

The */R* or */RP* options tell SuperSpool to immediately continue output at the beginning of the specified page. You can use these options to restart your output at a convenient reference point (the top of the current or previous page) should the printer jam or otherwise malfunction. The purpose of these options is *not* to print multiple copies of the same document. You cannot use the /R and /RP options unless at least one page has been printed.

It is recommended that you use the /R and /RP options in this sequence:

1. From DOS, enter this command to stop printer output:

 SUPERSPL /S

2. Adjust the printer paper to place the paper at the top-of-form position, and so forth. If the printer has a control to set the top-of-form ("TOF Set" or equivalent), use it.

3. Enter the following command to restart printing at the current or previous page, respectively.

 SUPERSPL /R or **SUPERSPL /RP**

5.3.6 Changing the IRQ Number for a Parallel Printer

In addition to the MODE command, the following options affect the configuration of SuperSpool when it is used with a parallel printer.

[/PINT[=X]]

This option sets the Interrupt Request (IRQ) number, which determines the intervals at which data is transferred from the SuperSpool buffer to the printer.

Without this option, data is transferred from the timer interrupt level (IRQ 0), at a uniform interval.

However, when */PINT* is specified, data transfer is driven by an interrupt signal sent by hardware and is designed for the most efficient use of the printer, rather than at a uniform interval.

If */PINT* is specified without a number, the default IRQ number is used. By default, IRQ 7 is used for LPT1 and IRQ5 is used for LPT2 (in the IBM PC-AT).

The variable X can be any number from 0 to 7, but values other than 7 and 5 are only used with specially designed printer hardware. For the significance of each IRQ number, see Appendix C at the back of this manual.

Early parallel ports were not able to properly support this function. If this option does not provide sustained character output, it should be removed from the command line.

5.3.7 Changing the IRQ Number for a Serial Printer

[/SINT=X]

This option sets the Interrupt Request (IRQ) number, which determines the intervals at which data is transferred from the SuperSpool buffer to the printer.

Without this option, the default IRQ is used. Generally, COM1 is assigned to IRQ4 and COM2 is assigned to IRQ3. The variable X can be any number from 0 to 7, but IRQ values other than 4 and 3 are only used with specially designed printer hardware. For the significance of each IRQ number, see Appendix C at the back of this manual.

5.4 Advanced SuperSpool Examples

The following examples show how the advanced options are used with parallel printers, serial printers. Examples of commands using the printer control and page reprint options, which can be used identically with either type of printer, are also provided.

5.4.1 Advanced Parallel Printer Examples

Example 1
The following command spools printer output to LPT1 using the default IRQ value as indicated by the /PINT option. Because the */U = xxx* option was not used, it reserves by default a minimum of 64 KB for the applications program. Reserves by default 64 KB for use as the spool buffer.

SUPERSPL LPT1:/PINT <Enter>

The following command spools printer output to LPT1. Because the /U = xxx option was not used, reserves by default a minimum of 64 KB for the applications program. Reserves 16 KB for use as the spool buffer. Sets the number of lines per page to 60. Enables subsequent use of the /R and /RP commands. Disables memory management calls.

SUPERSPL LPT1:/M = 16/LPP = 60/B/DMMGMT <Enter>

5.4.2 Advanced Serial Printer Examples

Example 1
The following command spools printer output to serial port COM1 (redirected from LPT1) at 1200 Baud, no parity, 8 data bits, 1 stop bit. Because /U = xxx option was not used, reserves by default a minimum of 64 KB for the applications program.

The /EXTM parameter enables 200 KB of memory above 1 MB for use in a spool buffer. The /M option allocates 400 KB of total memory to the spool buffer, so 200 KB will be taken from above 1 MB, and 200 KB will be taken from the first MB of memory. The /B option enables subsequent use of the /R and /RP commands. Disables block transfer interface (you should use the /DBI option to avoid a conflict if your applications software used interrupt vector INT 58 hexadecimal).

SUPERSPL LPT1: = COM1:/RATE = 1200,N,8,1/B/DBI /EXTM = 200/M = 400 <Enter>

Example 2
The following command spools printer output to serial port COM1 (redirected from LPT1) at 2400 Baud, even parity, 7 data bits, 1 stop bit. It monitors the CTS input from the printer to determine when data can be sent to it, and ignores the DCD and DSR inputs. Because the /U = xxx option was not used, reserves by default a minimum of 64 KB for the applications program. Reserves 100 KB for use as the spool buffer. The /B option enables subsequent use of the /R and /RP commands. Disables all memory management calls.

SUPERSPL LPT1: = COM1:/RATE = 2400,E,7,1/ON = CTS/OFF = DCD,DSR /M = 100/B/DMMGMT <Enter>

5.4.3 Printer Control and Page Reprint Examples

Some of these examples apply only to serial ports (as indicated), but most can be used for a parallel or serial printer.

Example 1
The following command redirects LPT1 to serial port COM2 using all previously defined SuperSpool options and the previously defined parameters for COM1. The spool buffer must be empty when redirecting ports. It also uses the /B option to enable page reprint functions.

SUPERSPL LPT1:=COM2:/B<Enter>

Example 2
The following command can be used while printing; it stops the printing, and sets lines per page equal to 66.

SUPERSPL /LPP=66/S<Enter>

Example 3
The following command restarts printing beginning at the previous page. (this assumes that the */B* option has been used in a previous command to enable page reprinting.)

SUPERSPL /RP<Enter>

Example 4
The following command terminates redirection to the serial port, and directs the spooler output to parallel printer LPT1. The spool buffer must be empty when redirecting ports. LPT2 reverts back to being LPT1, and so forth.

SUPERSPL LPT1:<Enter>
(after prior redirection to serial port)

Example 5
The following command enables the /R and /RP print options.

SUPERSPL /B<Enter>

Example 6
The following command is used while printing to display SuperSpool status after sending a formfeed character to the printer.

SUPERSPL /FF<Enter>

Example 7
The following command sends a carriage return character followed by a linefeed to the printer.

SUPERSPL /STRING=13,10<Enter>

5.5 SuperSpool Application Notes

The following sections discuss how to best handle particular tasks when using SuperSpool, such as checking on the SuperSpool status, and changing the printer configuration.

5.5.1 Determining SuperSpool Status

Once you have activated SuperSpool, you can check its status at any time by entering the appropriate SUPERSPL command. The current printer configuration and spool buffer status (number of bytes remaining to be printed) will be displayed for reference at the completion of any SUPERSPL command. While spooling is taking place, simply enter "SUPERSPL" from DOS to check its status.

5.5.2 Changing Printer Configuration

You can change the SuperSpool-directed printer port configuration when the spool buffer is empty. However, you can only modify the memory and buffer configuration options (/M, /M=xxx, or /U=xxx) after rebooting the computer.

5.5.3 SuperSpool Compatibility

The SuperSpool program is designed to be transparent to PC data files. The output of data files is done via the LPTn parallel ports or the COMn serial ports (after invoking the SuperSpool Redirect Output option).

If you use word processing programs that have custom printer selections, you can use only their parallel printer option if you want to use SuperSpool for output. Most word processing

programs have special serial port driver routines which may not be compatible with the SuperSpool program. This may also be true of any other applications software which allows you to customize its serial printer output parameters. THIS INCOMPATIBILITY IS NOT CAUSED BY A PROBLEM WITH SUPERSPOOL!

The SuperSpool software was designed to determine its own output parameters and is not meant to contend for output resources with another program. Consult with the supplier of your other software for advice on how to disable its custom serial port driver routines.

Certain programs, especially word processors, will not instantaneously send a large document out to a printer. These programs modify the print data "on the fly", which takes time. They will probably run faster with SuperSpool than without it, but not as fast as, for example, LLISTing a BASIC program through SuperSpool.

Once the SuperSpool program has started, you can output data or files using DOS COPY commands or BASIC and BASICA PRINT commands via the parallel port. The Print Screen command will also work.

Always use the SuperSpool Redirect Output option if you want to spool to a COMn serial port. Do not use the DOS MODE command as a shortcut to redirect printer output; doing so will short circuit the SuperSpool software.

5.5.4 SuperSpool Utility Batch Files

You can invoke the SuperSpool program from an AUTOEXEC.BAT file just like SuperDrive. The only real restriction is that the SUPERSPL command must immediately follow those for SuperDrive, and a "MODE LPT1:" command should be invoked before everything else (necessary only once per session). Refer to the "Batch Processing" section of your IBM *DOS Manual* for more detailed information on batch files.

You may want to add one or more batch files to your DOS boot diskette to allow you to invoke the Printer Control options or display SuperSpool status automatically when you type in a short command while under DOS. This eliminates the lengthy commands you would have to use otherwise.

The commands in the following example create a batch file that spools print data to a typical NEC™ serial printer at 1200 Baud, even parity, 7 data bits, 1 stop bit. It monitors the CTS signal, ignores the DCD and DSR signals, sets up a 16-KB print spool buffer, and selects page reprint functions. It also allocates a minimum of 64 KB for an applications program. This example includes the exact keyboard sequences for creating the batch files.

```
COPY CON: NEC.BAT <Enter>
MODE LPT1:
SUPERSPL LPT1: = COM1:/RATE = 1200,E,7,1/ON = CTS/OFF = DCD,DSR/M = 16
/B <Enter>
<F6> <Enter>
```

Once the above file is on your DOS diskette, all you have to do to initialize SuperSpool for this NEC printer is type in:

NEC <Enter>

5.5.5 Using Buffered Printers

Certain printers, which contain large "buffers", may run very slowly with SuperSpool if their buffering features are enabled. Disabling the buffer in this type of printer will correct this problem. See your printer manual for information on disabling its buffering capabilities.

SECTION 6

fASTdisk

The basic form of the fASTdisk DEVICE command and instructions on adding the command to the CONFIG.SYS file are provided in Section 2.6. This section gives the full set of optional parameters that you can use in each of two command formats for installing fASTdisk. A format similar to the SUPERDRV and SUPERSPL commands is followed by a format that is compatible with the command used to install IBM's VDISK. Some example commands and rules for using fASTdisk are also included.

6.1 Complete fASTdisk DEVICE Command

The complete form for the fASTdisk DEVICE command is as follows:

```
DEVICE = FASTDISK.SYS [/SSIZE = xxx][/DIR = xxx]
[/M[ = xxx]][/U = xxx][/EXTM[ = xxxx[,xxxx]]][/DEXTM][/TSIZE = xxxxx]
[/DL][/DH][/DNC]
```

Each of the parameters shown in brackets is optional and can be entered in any order. The preceding slash (/) is used to separate the options. DO NOT use a comma to separate options. The DEVICE command is entered on one continuous line. Several lines are used above to show option groupings.

6.1.1 Sector and Directory Size Options

[/SSIZE = xxx]

This option sets the sector size for fASTdisk in bytes. Allowable sizes are 128, 256, or 512. The default value is 128.

[/DIR = xxx]

This option sets the number of root directory entries that the fASTdisk can contain. The default is 64. The value specified may range between 2 and 512.

If the value specified multiplied by the size of the directory entry (32 bytes) does not equal a multiple of the sector size, fASTdisk will automatically round up the number of directory entries until a multiple of the sector size is reached.

If the size of fASTdisk does not allow enough room for the directory size specified, then fASTdisk automatically decreases the directory size by one sector at a time. An error message is issued if there is no room for a 1-sector directory. One of the directory entries is used to hold the volume label for fASTdisk.

6.1.2 Memory Allocation Options

[/M[=xxxx]

This option specifies the size of the fASTdisk in KB, varying the default allocation of 512 KB. The range of values that you can specify is between 1 and the maximum available memory on your PC.

The actual amount of memory used up for the fASTdisk will be slightly more than the value specified by */M=xxx*.

If */M* is specified without any numeric value, then all remaining available memory is allocated to fASTdisk. If you use this form of the option, then the */U=xxx* parameter should be used to reserve some of the memory for use by other applications SuperPak, and device driver programs.

[/U=xxx]

This option specifies the minimum amount of memory in KB to be reserved for use by applications programs or other device drivers. The default value is 64 KB. The value specified by the */U=xxx* option has priority over all other memory allocation.

The value specified by */U=xxx* is only a minimum; there may be more available if you have not allocated all other memory to SuperDrive and/or SuperSpool. After creating your fASTdisks, you can verify how much user memory is available by using the DOS CHKDSK command.

If you use the */U=xxx* option to reserve space for a program other than another SuperPak utility, you should use the exact same */U=xxx* parameter in all SuperDrive, SuperSpool, and subsequent fASTdisk commands. (You can specify decreasing amounts of reserved memory in subsequent SuperPak commands if each command is using space reserved by the preceding command.)

[/EXTM[=xxxx[,xxxx]]]

This option is available only on a PC-AT with extended memory, or when your computer has AST Research's *RAMpage!* or RAMpage AT expanded memory boards and *RAMpage!* software installed. This software includes the RAMpage Expanded Memory Manager (REMM) and RAMpage Extended Memory Emulator (REX). (Refer to Section 3.5 for further information on using SuperPak with *RAMpage!*.)

This option enables use of available memory at or above 1 MB by fASTdisk. Memory in the first MB can also be used if necessary. Usually, */EXTM* is specified without any numeric fields, allowing your fASTdisk to use any available memory at or above 1 MB.

The amount of memory actually used by fASTdisk is determined by the default (512 KB) or the */M=xxx* option. Once you have used a form of the */EXTM* option with a fASTdisk, SuperDrive, or SuperSpool command, then that same option is automatically applied to any following SuperDrive, SuperSpool, or fASTdisk commands, UNLESS one of those commands disables use of the */EXTM* option with the */DEXTM* option.

To avoid possible conflicts with some applications programs, two numeric fields are provided to allow you to restrict the amount and range of expanded memory that fASTdisk can use. *The first field (four xs) represents the number of 1-KB blocks at or above 1 MB of memory that fASTdisk can use.* If you want to specify an offset without restricting the amount of memory to be used, specify a 0 in this field (0 indicates no limit, the default).

The second field (four xs) indicates a starting offset for the portion of memory above 1 MB that fASTdisk can use. The default value is 1024 (1 MB). Any offset specified should be at least 1024 since this is where memory above 1 MB begins.

An offset can be specified to keep fASTdisk from conflicting with other software using memory above 1 MB, such as IBM's VDISK. No such conflict occurs between fASTdisk and SuperSpool or between fASTdisk and SuperDrive.

If VDISK is operating in extended memory, then you should always place the memory used by fASTdisk after VDISK. For example, if VDISK is operating in the first 800 KB of memory over 1 MB (address 1024 to 1824 KB), and all of the remaining memory is to be available for use by fASTdisk, SuperDrive, and SuperSpool, then the parameter specified should be /EXTM=0,1824 (since 1024 + 800 = 1824).

[/DEXTM]

This option is only used when more than one fASTdisk is being created. If a form of the *[/EXTM]* option was used in a previous fASTdisk command, then this option can be used to *disable* use of memory at or above 1 MB for the current fASTdisk that is being created.

*[/TSIZE=*xxxxx]

This option is used only when part of the fASTdisk is in memory at or above 1 MB (when the */EXTM* option has been used). The TSIZE option sets the maximum number of bytes of data that can be transferred in and out of memory above 1 MB at a time. You can supply any value from 16 bytes to 32,000 bytes (32 KB) with this parameter. The default value for transfer size is 2048 bytes.

The number of bytes you supply with this parameter is rounded down to the nearest multiple of 16 by fASTdisk to yield the actual transfer size, so it is advisable to supply a multiple of 16.

This option may affect interrupt handling since interrupt handling may be suspended while data transfers take place. If interrupts are being lost, then TSIZE should be decreased.

6.1.3 Disabling Memory Regions

The following options are for users who have more memory actually installed in their computer than indicated by their system board switch settings (expanded/extended or high memory), or for users who have have noncontiguous memory at hexadecimal address :C0000 or higher. Definitions of contiguous and noncontiguous memory are included in Appendix A.

[/DH]

This option (Disable High-Memory Use) prevents fASTdisk from using any portion of contiguous memory which might be available above the limit set by the system board switches. It does not, however, prevent them from using any noncontiguous memory which may be present beginning at hexadecimal address :C0000, or from using memory available below the switch settings. It has no effect if there is no contiguous memory available above the switch settings.

[/DL]

This option (Disable Low-Memory Use) prevents fASTdisk from using any portion of user memory for data storage; contiguous memory below the limit set by the system board switches. It restricts them to using only the memory available above the switch settings. If noncontiguous memory is available beginning at hexadecimal address :C0000, it is used first. A portion of user memory will always be used for fASTdisk resident code.

[/DNC]

This option (Disable Noncontiguous Memory Use) prevents fASTdisk from using any noncontiguous memory which may be available beginning at hexadecimal address :C0000.

6.2 ALTERNATIVE fASTdisk DEVICE COMMAND — VDISK COMPATIBLE

There is a second form of the DEVICE command that can be placed in the CONFIG.SYS file to install fASTdisk. This second form is provided for compatibility with the format for the VDISK DEVICE command provided in the IBM *DOS Manual* (version 3.10). It provides a subset of the options in the other command given earlier in this section, but uses a slightly different format.

In the following VDISK-type command format, the first line of options must be entered in the order shown. The second line of options can be entered in any order, as long as they follow all of the first-line options.

The VDISK-type format that is acceptable for the fASTdisk DEVICE command is as follows:

DEVICE = FASTDISK.SYS [aaa[bbb[ccc]]][/E[:d]]
[/DEXTM][/U = xxx][/DH][/DL][/DNC]

where:

aaa specifies the amount of memory (in units of KB) to allocate to fASTdisk. *aaa* corresponds to the xxx in the memory allocation option */M = xxx (Section 6.1.2).*

bbb specifies the sector size (in bytes) for fASTdisk. *bbb* corresponds to the xxx in the sector size option */SSIZE = xxx* (described in Section 6.1.1).

ccc specifies the number of directory entries for fASTdisk. The variable *ccc* corresponds to the xxx in the /DIR = xxx option (described in Section 6.1.1).

/E enables use of memory at or above 1 MB. The */E* option corresponds to the */EXTM* form of the */EXTM[= xxxx][,xxxx]]* option, (described in Section 6.1.2).

:d specifies transfer size for memory at or above 1 MB. *:d* corresponds to the */TSIZE* option (Section 6.1.2), except that the /TSIZE option specifies transfer size in bytes while the d option specifies transfer size in sectors.

[/DEXTM] is only used when more than one fASTdisks is being created. If a form of the */EXTM* option was used in a previous fASTdisk command, then this option can be used to *disable* use of memory at or above 1 MB for the current fASTdisk that is being created.

[/U=xxx] specifies the minimum memory to be reserved for use by applications programs. This option is described fully in Section 6.1.2.

[/DL] disables use of conventional memory below system board switch settings, except for what is needed for use by resident code. This option is fully described in Section 6.1.3.

[/DH] disables use of conventional memory above system board switch settings, except for what is needed for use by resident code. This option is fully described in Section 6.1.3.

[/DNC] disables use of noncontiguous memory. This option is fully described in Section 6.1.3.

6.3 RULES FOR USING fASTdisk

- If the REMM and REX device drivers used with AST's *RAMpage!* are used, then the fASTdisk DEVICE command must follow the REMM and REX commands in the CONFIG.SYS file.

- Because fASTdisk is installed from the CONFIG.SYS file instead of an AUTOEXEC file or DOS command, fASTdisk is always installed before SuperDrive and SuperSpool. The use or nonuse of the */EXTM* option by fASTdisk is automatically applied to the other two utilities if they are in use, or to subsequent usage of fASTdisk, (unless it is disabled by the */DEXTM* option).

- The fASTdisk DEVICE command has two different acceptable formats, the basic format and the VDISK-type format. Both are described in this section.
- If memory at or above 1 MB is present, there is no noncontiguous memory, and the *[/DNC]* option is not used.

6.4 Examples of fASTdisk DEVICE Commands

In the following examples, it is assumed that *RAMpage!* expanded memory at or above 1 MB is present, along with the REMM and REX software.

Example 1
In this example, two fASTdisks are created. The two commands shown would be located together in the CONFIG.SYS file. The first command uses the VDISK-type format. It creates a 200-KB fASTdisk which starts in memory at or above 1 MB (indicated by the */E* option). The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

The second command uses the basic format. This command creates a 100-KB fASTdisk (using the */M=100* option). Memory for the fASTdisk will be allocated first from remaining memory above the first fASTdisk created, and then from the 1st MB of memory if necessary. The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

```
DEVICE=FASTDISK.SYS 200 /E
DEVICE=FASTDISK.SYS /M=100
```

Example 2
This example also includes two fASTdisk DEVICE commands that could be included in a CONFIG.SYS file, one directly after the other. The first command uses the VDISK-type format. It creates a 50-KB fASTdisk with memory allocated from the first MB. This fASTdisk has 128 directory entries (indicated by the */DIR=128* option), and the default value for sector size (128 bytes).

The second command is shown in the basic format. It creates a 512-KB (default size) fASTdisk. Available memory at or above 1 MB will be allocated before memory in the first MB (indicated by the */EXTM* option). The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

```
DEVICE=FASTDISK.SYS 50/DIR=128
DEVICE=FASTDISK.SYS /EXTM
```

Example 3

The following command creates a fASTdisk that occupies as much memory as is available in the PC (indicated by the */M* option), except for 512 KB that is reserved for other device drivers and applications programs (by the */U=512* option). The fASTdisk memory is allocated starting at or above 1 MB (indicated by the */EXTM* option), and then from the first MB as well. The fASTdisk created has 128 directory entries in the root directory, indicated by the */DIR=128* option. The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

```
DEVICE=FASTDISK.SYS /M/EXTM/DIR=128/U=512
```

Example 4

The following command uses the memory management options to allocate all available memory at or above 1 MB to a fASTdisk. The */M* option indicates to use all available memory. The */EXTM* option indicates to use memory at or above 1 MB first. The */DL* and */DH* options disable use of any memory below 1 MB. The default values are used for sector size (128 bytes), directory size (64 files), and transfer size (2048 bytes).

```
DEVICE=FASTDISK.SYS /M/EXTM/DL/DH
```

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SECTION 7

RAMCLEAR

NOTE

The RAMCLEAR program should NOT be used when extended or expanded memory is present, such as on a PC-AT. RAMCLEAR should NOT be used whenever there is random access memory (RAM) storage above 640 kilobytes (KB) or system memory switches set to 640 KB.

When a PC with either 64 or 256 KB on its system board is first powered up, it will perform a memory diagnostic on all RAM, up to the memory limit set by system board switch SW2. This powerup diagnostic actually serves two purposes:

- To test memory for correct operation.
- To purge out any stray parity errors which may exist after power-up.

However, any memory that exists in the computer above the switch settings (up to hexadecimal address :9FFFF or between addresses :C0000 and :EFFFF) will not be parity purged and may generate false parity errors if a memory read is attempted in those address ranges.

The RAMCLEAR.COM program initializes these memory areas so that false parity errors do not occur.

To invoke the RAMCLEAR program, type in a command using this format:

RAMCLEAR [/DH][/DNC] <**Enter**>

You can include the /DH and /DNC parameters in the RAMCLEAR command line. The correct syntax is:

RAMCLEAR [/x]<Enter>

where *x* refers to the /DH and /DNC parameters described below.

You can specify the parameters one after the other; do not use a space or a comma to separate parameters. A slash (/) must precede each parameter in the command.

You can run RAMCLEAR by simply entering this command from the DOS prompt:

RAMCLEAR<Enter>

This assumes that you have copied the RAMCLEAR.COM program from the SuperPak master diskette onto your working DOS diskette. You can also make RAMCLEAR a part of your AUTOEXEC file. In either case, RAMCLEAR should be the first command given at powerup. Do not issue RAMCLEAR at any time after any other commands or programs.

[/DH]

This option (Disable High-Memory Use) prevents the RAMCLEAR program from initializing any portion of contiguous memory which might be available above the limit set by the system board switches (only the PCs with 64 or 256 KB of system board memory have high memory). It does not, however, prevent RAMCLEAR from initializing any noncontiguous memory which may be present beginning at hexadecimal address :C0000 and up. It has no effect if there is no contiguous memory available above the switch settings.

[/DNC]

This option (Disable Noncontiguous Memory Use) prevents the RAMCLEAR program from initializing any noncontiguous memory which may be available beginning at hexadecimal address :C0000.

RAMCLEAR will perform no useful function in a PC-XT because the computer will automatically see and initialize all user RAM. Also, IBM does not recommend support for user memory between hexadecimal addresses :C0000 and :EFFFF if there is RAM above :C0000, for the following systems:

- The PC with a 256-KB system board.
- The PC-XT.
- The PC with a 64-KB system board (with the new ROM BIOS supplied with the IBM hard disk add-on).

The RAMCLEAR program has no effect on the normal parity error detection capability of the hardware.

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APPENDIX A

Glossary

Refer to your IBM Personal Computer manuals for an explanation of terms or concepts related to DOS functions (AUTOEXEC.BAT files, batch files, DOS commands, default drive, and so forth).

Applications program
The program the user is going to run after setting up SuperDrive and/or SuperSpool. This could be a word processor, general ledger, or any other software. To prevent SuperDrive and SuperSpool from disturbing the applications program, use the */U = xxx* option to reserve an area of memory for it.

Buffer portion
The data storage area of memory used by either SuperDrive or SuperSpool, as opposed to the resident (program) portion. The size of this area of memory is controlled by the */M* or */M = xxx* option.

Contiguous memory
Memory in the 640-KB range from hexadecimal address 00000 to 9FFFF, with no gaps. Memory below the limit set by the system board switches is referred to as "low memory". Memory above the limit set by the switches is referred to as "high memory". The PC-XT has only contiguous, low memory.

Device Driver Program
A program that allows extra devices, such as disk drives or add-on boards, to be linked into DOS.

Expanded memory
Memory above 640 KB that is accessed by expanded memory manager software such as the RAMpage Expanded Memory Manager (REMM) and the RAMpage Extended Memory Emulator (REX).

Extended memory
Memory at or above 1 megabyte (MB) on the PC-AT.

Kilobyte
A unit of measure for memory. KB is an abbreviation for kilobyte. One KB is equal to 1024 bytes of memory.

Logical disk drive
An electronic disk drive being simulated in memory space by SuperDrive software.

Megabyte
A unit of measure for memory. MB is an abbreviation for megabyte. One MB is equal to a thousand kilobytes, and approximately a million bytes, of memory.

Noncontiguous memory
Memory that begins following a gap in addressing in certain PC configurations. When a PC with 64 KB of system board memory (without the new ROM BIOS) uses the AST MegaPlus II and 256-KB MegaPak with the Split-Memory Addressing function enabled, then noncontiguous memory is available from hexadecimal address :C0000 to :EFFFF. You cannot use noncontiguous memory in the PC with 256 KB of system board memory, the PC-XT, PC-AT, or a PC with 64 KB of system board memory that has the new ROM BIOS installed.

Physical disk drive
A mechanical floppy disk drive (not a SuperDrive).

Resident portion
The program portion of either SuperDrive or SuperSpool, as opposed to the portion used for storing data (the buffer portion). Also refers to the program portion of the DOS MODE command used by SuperSpool.

User area
The area of memory set aside for the applications program by SuperDrive and SuperSpool via the */U=xxx* option. SuperDrive and SuperSpool will not disturb this area of memory. This area will never be less than 64 KB in size.

APPENDIX B

PATCHING DOS FOR ADDITIONAL DRIVES

SuperDrive normally requires you to set DIP switch SW1 on your IBM PC system board for the total number of floppy drives including SuperDrives, or on a PC-AT to use the SETUP program for determining the number of floppy drives. Under certain circumstances, you might prefer to leave the switch or SETUP parameter set for the actual number of physical drives in the computer. For example, single drive users may want to leave the switch or SETUP parameter set for only one drive to avoid problems when COPYing file-by-file.

We recommend that you change the system board switch or SETUP parameter (on the PC-AT) so that you do not have to make permanent patches to DOS. This helps maintain a high degree of compatibility between SuperDrive and other application software.

As an alternative to changing the system board switch (or SETUP parameter), you may want to make the following patches to DOS itself. The main disadvantage of this method is that you now must maintain two different versions of DOS; one patched version for use with SuperDrive, and a separate version for use without SuperDrive. We don't recommend making patches to DOS; if you do, you run the small risk of creating incompatibility with other software which might also require patching DOS.

This appendix presents four DOS patch procedures; the procedure you use depends on whether you are patching DOS 2.0, 2.1, 3.0 or 3.1. Never make patches to your original DOS diskette! Use only copies. After making the patch, be sure to make a notation on the diskette label (and on subsequent copies of the patched diskette) that it has been modified.

These procedures assume that a DOS 2.0 diskette contains the DOS 2.0 version of DEBUG.COM, a DOS 2.1 diskette contains the DOS 2.1 version of DEBUG.COM, and so forth.

You enter all **boldface** text. Unless otherwise specified, use the spacebar between keyboard entries. Note that at two points in the procedures for DOS 2.0 and 2.1, you will make a selection for the values "xx" and "yy" from the Table B-1. depending on whether your system board switches are currently set for one or two drives, and also depending on how many drives you want DOS to see after the patch.

Table B-1. Variable Values for Setting the Number of Drives.

Switches Set for One Drive	Switches Set for Two Drives
xx = 40 2 Drives xx = 80 3 Drives xx = C0 4 Drives yy = 02 2 Drives yy = 03 3 Drives yy = 04 4 Drives	xx = C0 3 Drives xx = 80 4 Drives yy = 03 3 Drives yy = 04 4 Drives

B.1 Patching PC-DOS 2.0 for Additional Drives

Boot the computer with a DOS 2.0 diskette containing DEBUG.COM.

```
A>DEBUG<Enter>
-L100 0 D 1<Enter>                    For a single-sided,
                                      9-sector DOS diskette.
```

or

```
-L100 0 10 1<Enter>                   For a double-sided,
                                      9-sector DOS diskette.

-A10D<Enter>
  XOR SI,SI<Enter>
  PUSH SI<Enter>
  POP DS<Enter>
  XOR BYTE PTR [410],xx <Enter>
  PUSH CS<Enter>
  PUSH CS<Enter>
  POP DS<Enter>
  POP ES<Enter>
  MOV WORD PTR [SI],71B<Enter>
  POP AX<Enter>
  MOV AL,yy<Enter>
  NOP<Enter>
  <Ctrl-Break>

-W100 0 D 1<Enter>                    For a single-sided,
                                      9-sector DOS diskette.
```

or

```
-W100 0 10 1<Enter>                   For double-sided,
                                      9-sector DOS diskette.

-Q<Enter>

A><Ctrl-Alt-Del>                      Reboot the computer.
```

B.2 Patching PC-DOS 2.1 for Four Drives

Boot the computer with a DOS 2.1 diskette containing DEBUG.COM.

```
A>DEBUG<Enter>
-L100 0 D1                          For a single-sided,
                                    9-sector DOS diskette.
```

or

```
-L100 0 10 1                        For a double-sided,
                                    9-sector DOS diskette.

-A18A<Enter>
  XOR SI,SI<Enter>
  PUSH SI<Enter>
  POP DS<Enter>
  XOR BYTE PTR [410],xx<Enter>
  PUSH CS<Enter>
  PUSH CS<Enter>
  POP DS<Enter>
  POP ES<Enter>
  MOV WORD PTR [SI],798<Enter>
  POP AX<Enter>
  MOV AL,yy<Enter>
  NOP<Enter>
  <Ctrl-Break>

-W100 0 D 1<Enter>                  For a single-sided,
                                    9-sector DOS diskette.
```

or

```
-W100 0 10 1<Enter>                 For a double-sided,
                                    9-sector DOS diskette.

A><Ctrl-Alt-Del>                    Reboot the computer.
```

B.3 Patching PC-DOS 3.00 for Four Drives

Boot the computer from drive A: with a DOS 3.00 diskette containing DEBUG.COM that can be written to (is not write-protected).

A>**DEBUG <Enter>**

-L100 0 14 1 <Enter> For a double-sided, 9-sector DOS diskette.

-A23F <Enter>
XOR AX,AX <Enter>
MOV DS,AX <Enter>
OR BYTE PTR [410],C0 <Enter>
MOV AL,4 <Enter>
JMP 251 <Enter>
<Ctrl-Break>

W100 0 14 1 <Enter> For double-sided, 9-sector DOS diskette.

A>**<Ctrl-Alt-Del>** Reboot the computer with this patched 3.00 DOS diskette.

B.4 Patching PC-DOS 3.10 for Four Drives

Boot the computer from drive A: with a DOS 3.10 diskette containing DEBUG.COM that can be written to (is not write-protected).

```
A>DEBUG<Enter>
A>DEBUG <Enter>

-L100 0 15 1 <Enter>          For a double-sided,
                              9-sector DOS diskette.
-A224 <Enter>
 XOR AX,AX <Enter>
 MOV DS,AX <Enter>
 OR BYTE PTR [410],C0 <Enter>
 MOV AL,4 <Enter>
 JMP 236 <Enter>
 <Ctrl-Break>

 -W100 0 15 1 <Enter>         For a double-sided,
                              9-sector DOS diskette.

A><Ctrl-Alt-Del>              Reboot the computer
                              with this patched 3.10
                              DOS diskette.
```

APPENDIX C

HARDWARE INTERRUPT LINES

This appendix gives the standard hardware interrupt listing for the IBM PC and PC-AT. To avoid conflicts, do not assign the same IRQ line to two different devices.

Table C-1. Interrupt Listings for IBM PC and PC-XT.

IRQ Line	Application
NMI*	Parity.
0	Timer.
1	Keyboard.
2	Reserved (standard AST-PCnet interrupt).
3	Asynchronous communications (secondary). IBM SDLC communications (secondary). IBM BSC (secondary). (Tallgrass hard disk factory-configured interrupt; Tallgrass can be configured for any IRQ line from IRQ through IRQ7.)
4	Asynchronous communications (primary). IBM SDLC communications (primary). IBM BSC (primary).
5	IBM fixed disk.
6	Diskette.
7	Printer.

*Non-Masked Interrupt

Table A-2. Interrupt Listings for PC-AT Only.

Interrupt Controllers		
CTLR 1 IRQ	CTLR 2 IRQ	
0		Timer output 0.
1		Keyboard (output buffer full).
2		Interrupt from CTLR 2.
	8	Realtime clock interrupt.
	9	Software redirected to INT 0AH (IRQ2).
	10	Reserved.
	11	Reserved.
	12	Reserved.
	13	Coprocessor.
	14	Fixed disk controller.
	15	Reserved.
3		Serial port 2.
4		Serial port 1.
5		Parallel port 2.
6		Diskette controller.
7		Parallel port 1.

APPENDIX D

CREATING AUTOEXEC AND CONFIG.SYS FILES

General instructions follow on how to create an AUTOEXEC.BAT (also referred to as AUTOEXEC) or CONFIG.SYS file, or modify an existing file. More detailed information about how to tailor your AUTOEXEC.BAT file to install SuperDrive and SuperSpool is given in Sections 4 and 5.

D.1 Creating an AUTOEXEC File

To create an AUTOEXEC.BAT file, start by entering the following command:

A>**COPY CON: AUTOEXEC.BAT** <**Enter**>

This COPY command allows you to copy the information you will enter from your standard input device (such as a keyboard) into an AUTOEXEC.BAT file located on the diskette in your default drive. After you enter the COPY command shown above, the cursor will drop down a line. You should then type in each command to be included in your AUTOEXEC file on a separate line, and end each line by pressing the <**Enter**> key. When the file is completed, press the <**F6**> function key, then the <**Enter**> key to end copying to the file.

In the following example AUTOEXEC.BAT file, SuperDrive and SuperSpool are run with default parameters.

```
SUPERDRV C:
SUPERSPL LPT1:
```

D.2 Modifying an AUTOEXEC File

If you already have an AUTOEXEC file on your boot diskette, and you wish to add to it commands for some of the SuperPak utilities, do the following:

STEP 1
Determine what is currently in your AUTOEXEC file: at the DOS prompt A>, insert the boot diskette to be modified in drive A: and enter the following:

A>**TYPE AUTOEXEC.BAT** <**Enter**>

STEP 2
Enter the following DOS COPY command:

A>**COPY CON AUTOEXEC.BAT** <**Enter**>

The cursor will drop down one line.

STEP 3
Modify your current AUTOEXEC.BAT file: type in the contents of the AUTOEXEC.BAT file as it is listed on your screen, except add the SuperDrive and/or SuperSpool commands to the file in the appropriate location. (For example, if one of the commands in your AUTOEXEC file copies files to the SuperDrive, then your SuperDrive command must precede the COPY command.) Press the <**Enter**> key at the end of each line.

STEP 4
Check the file carefully: ensure that all commands have been properly entered. After you have done this, press the following key sequence to close the file:

<**F6**><**Enter**>

D.3 Creating or Modifying a CONFIG.SYS File

A text editor such as EDLIN can be used to modify an existing CONFIG.SYS file on your working DOS boot diskette.

The instructions for creating a CONFIG.SYS file are identical to those for creating an AUTOEXEC file, except that the COPY command would be as follows:

A>**COPY CON: CONFIG.SYS**<**Enter**>

The CONFIG.SYS file must reside on your DOS boot diskette.

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APPENDIX E

SUPERDRIVE, SUPERSPOOL, AND fASTdisk: RULES FOR USING THEM TOGETHER

Following are a few rules that are useful to keep in mind, especially when you are using several SuperPak utilities together.

- If the */U = xxx* option is used to reserve space for applications programs, the identical */U = xxx* option should be used with all programs. However, if one utility uses the option to reserve space for other SuperPak utilities, later utility commands will reserve a smaller amount of memory than the first command.

- fASTdisk is *always* installed before SuperDrive and SuperSpool because it is installed through the CONFIG.SYS file, as your PC is started up (before the AUTOEXEC file). When using both SuperDrive and SuperSpool, the SuperDrive commands must immediately precede the SuperSpool commands. Both programs should be initialized before you run your applications software.

- If you want to reconfigure the */U = xxx*, */M*, */M = xxx*, or */EXTM* options for fASTdisk, SuperDrive or SuperSpool, you must reboot the computer and start from scratch.

- For fASTdisk, SuperDrive and SuperSpool to all use memory above 1 megabyte (MB), you only need to specify the */EXTM* option in the first fASTdisk (or other first) command. The option is automatically applied to all following commands unless it is discontinued by the */DEXTM* option.

Both SuperSpool and SuperDrive function properly with DOS, BASIC, and BASICA. There may be programs that will not work properly with a disk emulator or print spooler. For example, when you use SuperSpool with a serial printer and a program (such as a word processor) that has its own serial printer driver routine built-in, there may be conflicts between the programs that prevent proper operation.

Another example of incompatible programs are applications programs which expect to be loaded and executed out of a specific memory range. They may not allow themselves to be displaced to a different address by SuperDrive, SuperSPool and fASTdisk. The utilities will function properly only with IBM's PC-DOS. They may not work with any other operating system.

AST RESEARCH, INC.

Product Comment Form

SuperPak™
User's Manual
000300-001 B

We appreciate your comments regarding any problems or suggestions related to AST Research products. Please use this form to communicate any observations that you have concerning the improvement of either the product itself or the product documentation provided in this manual.

Submitter Information

Submitter's name:

Address:

Product/Manual Comments and Suggestions

Please mail this form to:

AST Research, Inc.
Attn: Product Marketing
2121 Alton Ave.
Irvine, CA 92714

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